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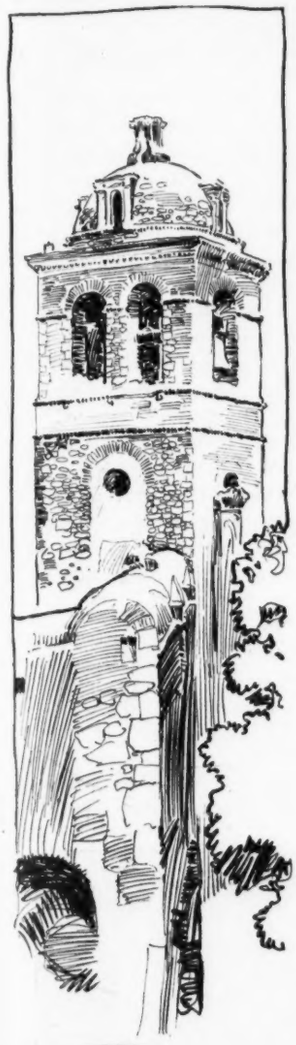
MOTOR AGE

# Mexico as a Market for Motor Cars



## Sigmund Krausz, Familiar with Conditions in the Republic, Claims There is a Good Opening for Americans

SUNNY MEXICO just now is suffering from the slump in the silver market and still is in the throes of a financial stringency brought on by the reflex of the panic in the United States of a little over a year ago. As a consequence the motor car market there is not in the best shape and an attempt to introduce a new make of car there at present must, of necessity, involve considerable outlay of time and money, although the state of affairs is not such as to preclude success. Conditions are gradually improving and it is only a question of a short time when this market will once more be ready for renewed exploitation.

**United States Is the Barometer**

The reason for this optimistic view of the Mexican situation is the fact that, just as hard times and business depressions in the United States invariably have their after-effect on our Latin-American neighbors, the return of prosperity in this country is equally felt by them. It will take Mexico several months to awaken to the improvement, while from 9 months to 1 year are generally necessary for our farther removed South American neighbors to realize changes in conditions. This statement is made with reference to ordinary circumstances only and does not bear on extraordinary local conditions such as record crops, the discovery of valuable mines, or, for example, such business depression as Mexico is experiencing just now on account of the low price of silver bullion.

**Mexico Certainly a Promising Field**

Putting aside all ifs and ands, and everything being in normal state, Mexico should certainly be a promising field for the invasion of the American motor car manufacturer. At all times of the year, the climate will permit of motoring; the road conditions in and around the centers of population which at present may be considered from a dealer's point of view, are fairly good—in some places excellent—and the purchasing public is of a class that not only has the money, but is willing to spend it for luxuries such as motor cars. Proof of this is that even now there are between 800 and 1,000 motor cars in the Mexican capital, a showing which must be called remarkable when compared, for example, with Rio de Janeiro, Brazil, a city whose population of over 900,000 doubly exceeds that of Mexico City and yet has no more cars running.

**Europe Has Good Footing**

Motor cars so far imported into Mexico have come principally from European markets, but the percentage of American cars does not show such a woeful minority as in Brazil, Uruguay and the Argentine Republic, not to speak of the South American states of the west coast where, as yet, hardly an effort has been made to introduce American machines. No doubt the large number of Americans settled in Mexico has a great deal to do with this favorable showing, but it must also be considered that geographical proximity and closer commercial intercourse

MOTORING SCENE ON BOULEVARD IN CHAPULTEPEC PARK

are instrumental in making the Mexican less prejudiced against the American product than is the case with the people of the South American republics mentioned.

The Mexican knows the Yankee can do things, but his inherent love of ostentation and dislike of the Yankee generally makes him look at the medium-priced and cheap cars put on his market from over the Rio Grande with something akin to mistrust, and only the late successful introduction of a couple of high-grade and high-priced American cars is opening now his eyes to the fact that the United States, too, can produce cars of quality. Thus it comes that American motor cars in Mexico at present are principally owned by American residents, while the great majority of Mexican owners still pin their faith mostly to French, Italian and German machines. It is surely a good sign, however, that so prominent a man as Senor Spindola, owner of the daily paper El Heraldo, has lately added an American make to his stable of six European cars.

It is worthy to remark here that one of the reasons working against American cars is the excessive freight rate charged by the American railroads. A couple of cars which the writer took there, although making a carload, cost in the neighborhood of $350 to Mexico City, about 50 per cent of the duty imposed on these five and seven-seated vehicles. In this connection the shippers' attention is called to the advisability of sending cars to destination in bond, as they may otherwise be detained for an unreasonable time at the frontier. an all-rail route is preferable to shipping via Vera Cruz on the west coast, as it does away with the trans-shipment and boxing, the freight rates being the same. A lowering in transport charges would help American manufacturers considerably, as it does not cost the European maker at present more to put his goods into Mexico City than it costs from the United States.

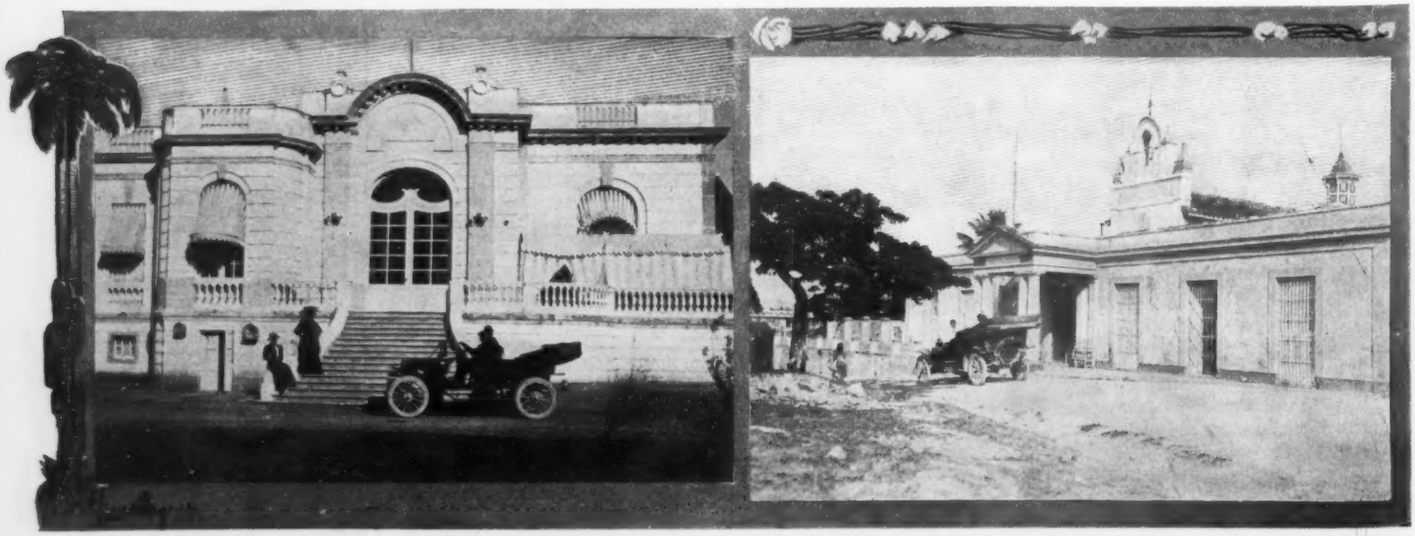
**European Makes in Mexico**

Among European machines in Mexico City are represented either by agencies, commissioners or branch houses the Renault, Panhard, Mors, Bayard-Clement, Lorraine-Dietrich, Peugeot, Darracq, Brouhot, Gregoire, Unic and one or two other minor French makes; the Fiat, of Italy; the Mercedes, of Germany; the Napier and Humber, of England, and a small sprinkling of Belgian and Swiss cars. Of these makes the Fiat and Peugeot alone are handled exclusively by *concessionaires* with proper garage facilities and salesrooms, while the rest are represented by commissioners without stock, or perhaps with a single machine for sample, and by agents who, as a rule, handle indiscriminately an international selection of cars that is almost bewildering. Thus, one of these houses, a native one, by the way, which claims the leading position, is said to represent not fewer than seventeen different makes. This does not mean, however, that it carries a stock or even has samples of all of these on hand. No; for often it sells from catalogs only and is satisfied with a small discount in such a case.

The discounts granted by foreign manufacturers to the Mexican trade average probably 25 per cent, the well-established makes not deviating from the usual 20 per cent and the less-known ones going as high as 33 per cent. These figures also apply to American makes, although they do not openly appear as discounts, as a rule, but are granted in the shape of rebates or one thing or another.

**American Cars Represented**

Of American motor cars so far introduced in the Mexican market there are the Pope lines, the Locomobile, Cadillac, Thomas, White, Chalmers-Detroit, Reo, Stevens-Duryea, Oldsmobile, Rambler, Ford, Haynes, Maxwell, Baker, Peerless, Packard, Buick and Stoddard-Dayton. Of these only the last three makes named are exclusively represented, while the others are in the hands of agents handling from four to ten different cars. These conditions naturally tend to demoralize the market, as no dealer under the circumstances can do justice to himself or the manufacturer he represents. Further demoralization is threatened by the introduction of the installment system as worked by one of the largest agencies, which claims to have doubled its sales by this selling method.



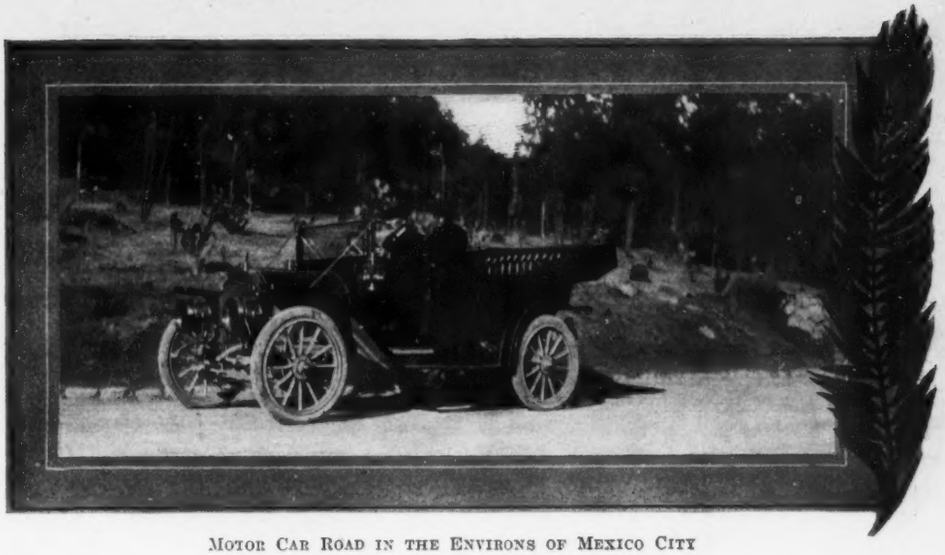
HOME OF AUTOMOBILE CLUB OF MEXICO CITY

SAMPLE OF TROPICAL ARCHITECTURE

Surely the American manufacturer who, for the sake of closing a small contract, gives away his sales rights to agents always willing to add to their lines, is making a grievous mistake. The writer knows it to be a fact that a good American car, heavily pushed and advertised last year, is being absolutely neglected this season by the same agent on account of two new lines which offer more profits to him. The best advice to be given an American manufacturer who, at this time, wants to introduce his product in Mexico—and this advice is applicable in general— is to send a personal representative with samples of leaders to demonstrate the merits of his product. This representative has to be equipped with the necessary qualifications for foreign trade, that is, knowledge of the business, language, experience in export and tact in handling foreign dealers. The latter qualification is of the utmost importance. The goal should be the securing of an exclusive agency, or, at least, one that will not handle directly conflicting lines. Under this is meant, for example, that an agent handling a water-cooled gasoline car of the popular type should not be allowed to sell another one of similar description, but may be permitted to take on an electric, a buggy type, a steam or an air-cooled car.

### Introducing American Cars

Apropos the introduction of cars in Mexico City, the writer wishes to call special attention to the solid construction and extraordinary hill-climbing qualities required. There are two or three fierce testing roads in the environs of the capital, any one of which will bring out the mettle of a car. Of these roads the one to Cuernavaca is generally selected as the touchstone of a newcomer. This road, starting at an altitude of about 7,000 feet, ascends the mountains to a height of 10,000 feet before reaching the downward grade to an altitude of 5,000 feet. The grades are extremely long and heavy, ranging from 5 per cent to 20 per cent and the trip of 75 miles offers, besides, an appalling variety of bad road conditions, such as deep sand and broken rocks.



MOTOR CAR ROAD IN THE ENVIRONS OF MEXICO CITY

The roads around the city, however, are as a rule excellent and with a little improvement here and there the motoring radius could be easily extended so as to make Mexico City the ideal motoring town of Latin America, especially the roads to Cuernavaca, Toluca, Pachuca and the pyramids of Teotihuacan. The pyramids, only 35 miles distant from the capital, are of great interest to tourists. They can, at present, be reached comfortably only by an early morning train. Since the one return train leaves the pyramid station in the evening, visitors are compelled to spend a whole day where 2 hours of sight-seeing would be sufficient. An enterprising American is now taking parties out there by motor car at a charge of $40—Mexican— and is doing a fair business, but the trip is hard on tires.

### Motor Car Livery Suggested

This suggests the subject of a motor car livery. There is no taxicab system as yet in operation in Mexico City, although the opportunities, in spite of cheap carriage fares, seem to be favorable. The stream of tourists visiting the city increases from year to year, the motor car as a means of locomotion grows in favor, and there are a number of popular resorts, such as San Angel's Inn, the American Country Club and others that could be reached quicker and more comfortably by motor cars than by horse-drawn vehicles. As it is, there is one motor car each on hire in front of the San Francis and New Porter hotel, the charges for which are arbitrarily fixed by the owner-chauffeur, and the Garage Anglo-Mexicano maintains a small livery service with Humber cars.

The thoroughfares of Mexico City are wide and mostly asphalt-paved. Sprinkling is not overdone, and there is no municipal speed limit. But it is nevertheless urgently advisable to always drive at moderate speed, as it is much easier to land in a Mexican jail than to get out of it. This advice is applicable not only to the capital, but to the country in general. The laws require, however, an owner's and a chauffeur's license. The first is regulated according to the seating capacity of the machine, a four-seated vehicle, for

PACKARD ON A TORTUOUS TRAIL IN MEXICO

CHARACTERISTIC COUNTRY ROADS IN THE REPUBLIC

PICTURESQUE SCENERY FOUND IN MEXICO

FORDING SHALLOW RIVERS EASY FOR THE MOTOR CAR

example, paying $6 and one of five or more seats $8—Mexican—per month. For a number tag, furnished by the authorities, an extra $2.50 is demanded. The permit for a chauffeur costs less than $1—Mexican—but the card has to bear the photograph of the licensee in a certain form. An examination is not required and this is evidently the reason why some incompetent drivers make the streets unsafe. The large majority of chauffeurs is native, and among the Americans plying this vocation in Mexico there are only a few who may be called competent and who have the necessary mechanical knowledge to make road repairs. Wages of drivers run from $30 to $40—Mexican—per week, but a really good man can command $50 or more.

**Scarcity of Good Chauffeurs**

The scarcity of good chauffeurs is more than equaled by that of good motor car mechanics, the latter being a crying need in all the garages. The garages are generally commodious and well equipped, but the general complaint of owners is that repairs are costly and slow. The high price of gasoline—60 cents Mexican and more per gallon—lubricants, accessories, etc., are also among the factors which tend to retard the development of the car business in the country, chief of which is the high profits which Mexican dealers expect to make in the trade.

In strong contrast with these features is the cheapness of garage facilities which may be had for $15 to $20—Mexican—per month, according to the size of the car, including washing and cleaning of brass. None of the garages in the capital has individual stalls, and the first to introduce such with doors to lock will execute a good business move, as most of the establishments are unable to keep unemployed chauffeurs and loafers out of their premises. In support of this opinion can be cited the experience of the writer in one of the principal garages where a horn bulb and rear lamp were stolen and a carbureter interfered with, not to mention the scratching of paint and other minor things.

In regard to tires the French and the German makes seem to be best represented in the republic, although some of the well-known American manufacturers have good agencies in the capital. Tire repairs, except of minor importance, are not made in the garages, and the Compania Vulcanizadora Mexicana, of which Jack Davis, an American, is the manager, has the practical monopoly of this business. In this branch of the trade, too, some garage men expect to get graft, the bills for tire repairs being generally rendered through the garage where the owner keeps his machine, even though he may have brought his tires directly to the repair shop. The conclusion is not hard to guess.

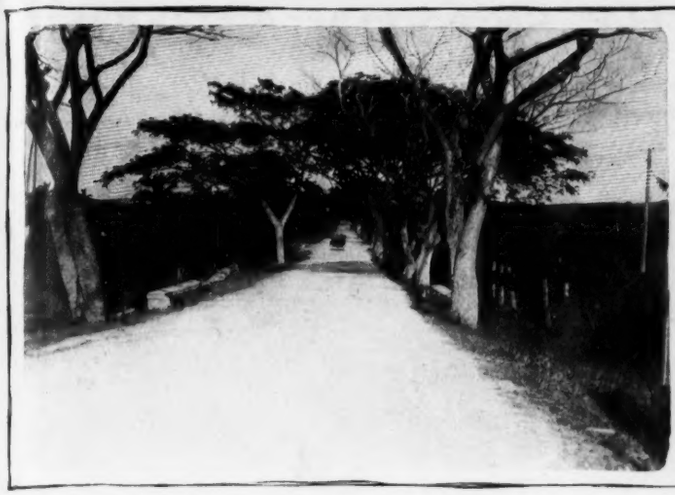
**American Accessories Popular**

American motor car accessories are gradually gaining ground against those of European manufacture which, only a short time ago, were exclusively in evidence in Mexico. Lamps, jacks, speedometers, glass fronts, tools, clothing and motor specialties of all kinds are articles that can be introduced and pushed with success, and several supply companies are already doing quite a business in such goods in Mexico. As yet there are not many American motor cycles in use there, but there is no reason whatever, unless it be the great home demand, why a good Yankee two-wheeler could not be introduced successfully and hold its own against the Europeans.

An American concern manufacturing motor trucks and commercial vehicles of various kinds would have still more chances for success. There is, at present, no dealer handling this class of vehicles for which, considering the commercial importance of Mexico City, there is certainly a demand. The European manufacturers of commercial cars have, as yet, made no efforts in this direction and since they do not enjoy the same advantage of reputation as with their pleasure cars, it seems that good American delivery wagons and trucks could easily gain a strong foothold.

There is a motor club in the Mexican capital, but it is more of a social organization than one which has been created to advance the interests of motoring, the improvement of roads and promotion of races. Its membership consists principally of

ON THE ROAD TO PYRAMIDS OF TEATCHUACAN



TEMPTING STRETCH OF FINE BOULEVARD

CERTAINLY NOT MUCH OF A ROAD

wealthy Mexicans who, aside from their interest as owners, do not concern themselves much about motoring sport. The clubhouse is a handsome building in Chepultepec park, which is the most attractive spot for city driving, but it is little frequented and not at all equipped for the purposes of a motoring organization.

In this article the writer has confined his observations to the capital of the country for the reason that, at the present time, it is practically the only place which may be considered from the manufacturer's point of view. Until interurban road conditions and other factors have changed to the better the car business of the Mexican republic can be more advantageously handled from Mexico City as a distributing center than by dividing up the territory among small and irresponsible agents. Just now there are only a few cities, outside the capital, which promise a notable development of the business in the near future.

**Guadalajara a Good Field**

Among these is, in first line, Guadalajara, the capital of the state of Jalisco, and second largest city of the republic. It is a clean, well-paved place of over 100,000 inhabitants, with some fair roads in the immediate environs. There are, at present, two small garages in the hands of an Italian and a native, but they lack capital to properly conduct the business and the majority of the cars owned in Guadalajara are purchased in Mexico City. Withal the number is small in proportion to the population.

Puebla, with close to 100,000 inhabitants, has for the last year or so been considerably handicapped in the way of motoring on account of the condition of its streets. The city is building a new sewer system and the thoroughfares are in frightful condition. There are said to be close to 100 motor cars in Puebla. Considering the slowness of things in Mexico, it is probable that Puebla will not enjoy a motoring boom within the next 2 years.

The most promising town in the near future is probably Monterey. It has only about 65,000 inhabitants, but there is a good percentage of Americans among them. The city is rapidly growing commercially and industrially and considerable wealth is being accumulated there. Like Chihuahua, it is at a large distance from the capital, and these two places will eventually be better handled by independent agencies than from Mexico City. Zacatecas and Guanajuato can, for topographical reasons, never be reckoned with, while San Luis Potosi may develop to quite a motoring town as soon as its streets and the surrounding roads make it ripe for an effort.

**Motor Boom in Merida Dead**

Merida, the capital of Yucatan, enjoyed quite a motor car boom several years ago and there were proportionately more cars then running on its broad, well-paved streets than in the capital itself. Business depression has caused a reversal and the city as a purchasing center for cars is dead now. However, there is still plenty of money in Merida.

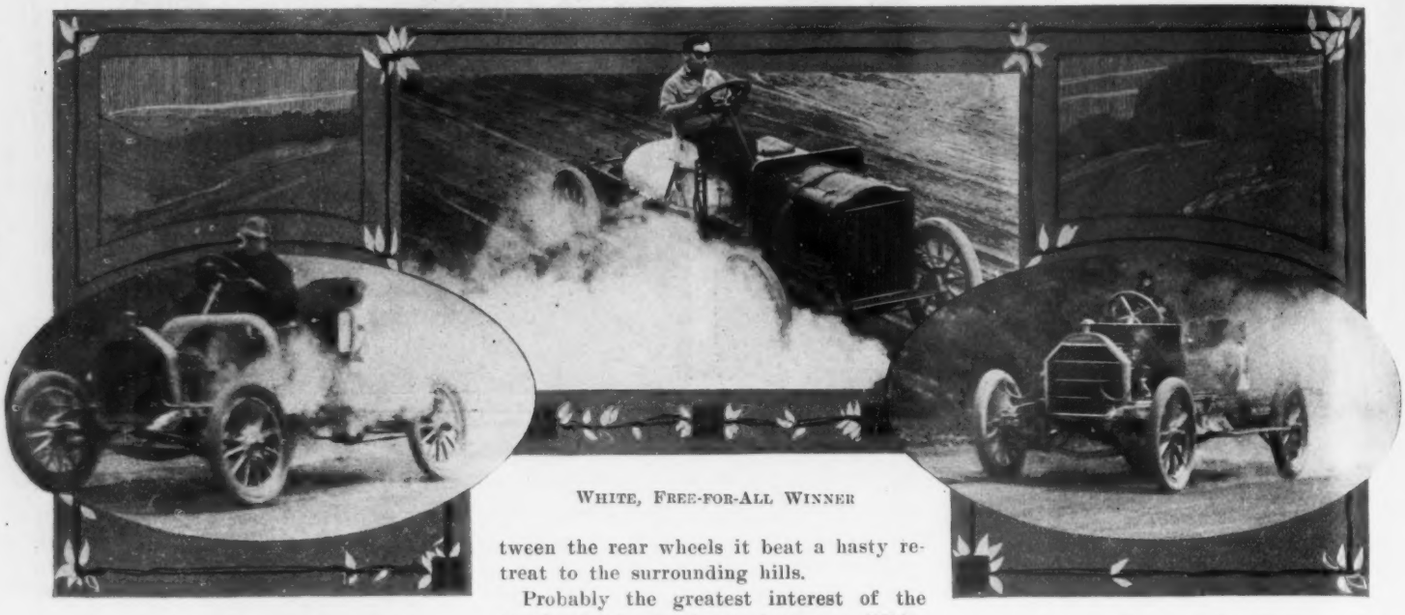
The present import duty into Mexico is 60 cents per kilo up to 250 kilos, which would make the duty on a 550-pound car $150. Between 250 and 750 kilos, or between 550 and 1,650 pounds, it is 50 cents a kilo; for over 750 kilos or 1,650 pounds, it is 40 cents per kilo. Mexico has an area of 772,652 square miles, its length from north to south is 2,000 miles and its greatest width 800 miles. Its present population totals 13,607,259, or nearly one-sixth the population of the United States. It has forty-five cities over 10,000 population each; the capital, Mexico City, is close to 375,000; Puebla is 100,000 and Guadalajara 101,000. The country consists of three levels; the hot lands bordering on the Gulf of Mexico, where the climate is eternal summer; the temperate lands nearer the interior, where it is continual spring; and the cold lands of the interior, at an altitude of 8,575 feet, where snow and ice are rarely known. The table lands are arid, yet fertile, and at places become marshes and at others desert. On these areas, where irrigation is resorted to, two crops a year are grown. In the mountain districts mining is the great occupation and this, owing to the scarcity of railroads, offers a good field for motor cars.

STODDARD-DAYTON ON A COUNTRY ROAD IN MEXICO

# FIRST HILL-CLIMB OF THE SEASON AT 'FRISCO



BUICK, WINNER OF ITS CLASS



WHITE, FREE-FOR-ALL WINNER



STEARNS SHOWING ITS SPEED

SAN FRANCISCO, CAL., March 28—San Francisco held its first motor car hill-climb of the season today, and it was an unqualified success. The affair took place on the Nineteenth avenue boulevard, just south of Golden Gate park, and 5,000 people gathered on the slopes of the hill to watch the cars as they rushed over the course, some of them topping the hill at a speed of almost 50 miles an hour. The climb was given by the San Francisco Motor Club, an organization which was started here a few months ago largely through the initiative and energy of W. R. Johnston, a former member of the Chicago Motor Club, now in business in San Francisco. The organization is entirely nonpartisan, and as a consequence it has succeeded in securing more entries for the events it has pulled off than has the dealers' association, which is a good deal torn by dissension. Today's climb was over a hill that was by no means a heavy grade and was not intended so much to be a test of the cars as to furnish the people of San Francisco with some entertainment and to arouse their personal interest and enthusiasm in the motor car.

In spite of the uncertainty of the weather, the hills on both sides of the mile course were covered with people, and they were by no means quiet in their encouragement of the cars that they liked. At the finish it was a hard task for the police to keep the crowd from surging over the track, but there was not a single accident during the afternoon. A roar of laughter was caused by the experience of a small pup which appeared directly in front of the Mitchell car as the latter rushed over the finishing line. The dog did not appear to be touched by the car, but the rush of wind rolled it over and over, and when it emerged from between the rear wheels it beat a hasty retreat to the surrounding hills.

Probably the greatest interest of the day lay in the match race between a White steamer, 20-horsepower chassis, and a Stoddard Dayton of the smaller type. The White covered the straightaway mile in 1:12⅖, which was the fastest time made by any car during the day. The Stoddard-Dayton's motor got going so fast at the start that Fred Wiseman, the driver, was unable to get into the high and he did not go over the full course. The White was protested on the ground that it was not a purely stock car, but the judges, when they found that there was no written agreement covering the match race, threw the whole thing out of court, declaring it no contest. They recognized the White's time, however, as the fastest of the day.

The little Stoddard-Dayton had no trouble in winning in its class—that for cars costing between $1,200 and $1,800—defeating several competitors. In the class for the smallest cars the honors went to the Buick White Streak, which was cleverly handled by Frank Murray, a local driver who has distinguished himself in a score of race meets and hill-climbs during the past couple of seasons. A privately-owned Thomas Forty, driven by a local man without great racing experience, captured the race for cars between $1,800 and $3,000.

One of the most interesting performances of the day was the victory of a 30-60 Stearns in the class for cars costing more than $3,000. The car used was one owned by Jack Lankershim, a young capitalist of Los Angeles, who had arrived in San Francisco with a party 3 days previously after a strenuous trip of 500 miles over rough and muddy roads. The car was stripped, and in the hands of D. A. Bonney, who has handled Stearns cars in these parts for the past two seasons, it rushed over the mile in 1:20.

The free-for-all went to a Stanley steamer, which covered the distance in 1:13⅗, or 1⅕ seconds slower than its steam rival, the White, in the latter's match race. Second in the free-for-all was the Comet, the little car made by Al Hall, a young engineer of this city, which made such a phenomenal record in California contests last season, winning almost everything in which it was entered, turning off miles on circular tracks very close to the minute, and sometimes under. Today, however, its driver, Frank Free, was somewhat handicapped by three broken ribs, which he fractured several days ago while practicing on the boulevard course.

Electric timing apparatus was used, and it proved remarkably successful. The cars themselves did the timing, and there was not a question as to the accuracy. Summaries:

CARS COSTING $1,200 OR LESS

| Car and driver | Time |
|---|---|
| Buick, C. F. Murray | 1:24 4-5 |
| Mitchell, A. E. Hunter | 1:35 |
| Auburn, G. C. Murray | 2:02 2-5 |
| **CARS LISTING FROM $1,800 TO $3,000** | |
| Thomas Forty, I. De Jongh | 1:21 2-5 |
| Buick, C. S. Howard | 1:25 2-5 |
| Comet, F. Free | 1:26 1-5 |
| Rambler, L. B. Harvey | 1:30 2-5 |
| Mitchell, A. E. Hunter | 1:53 2-5 |
| **CARS LISTING AT MORE THAN $3,000** | |
| Stearns, D. A. Bonney | 1:20 |
| Pope-Hartford, J. Fleming | 1:20 2-5 |
| Palmer & Singer, C. Onthank | 1:23 2-5 |
| Acme, F. Sheets | 1:25 2-5 |
| **CARS LISTING FROM $1,200 TO $1,800** | |
| Stoddard-Dayton, F. J. Wiseman | 1:20 |
| Oakland, W. W. McDonald | 1:40 2-5 |
| Overland, R. Fowler | 1:54 4-5 |
| Tourist, E. Ely | Did not finish |

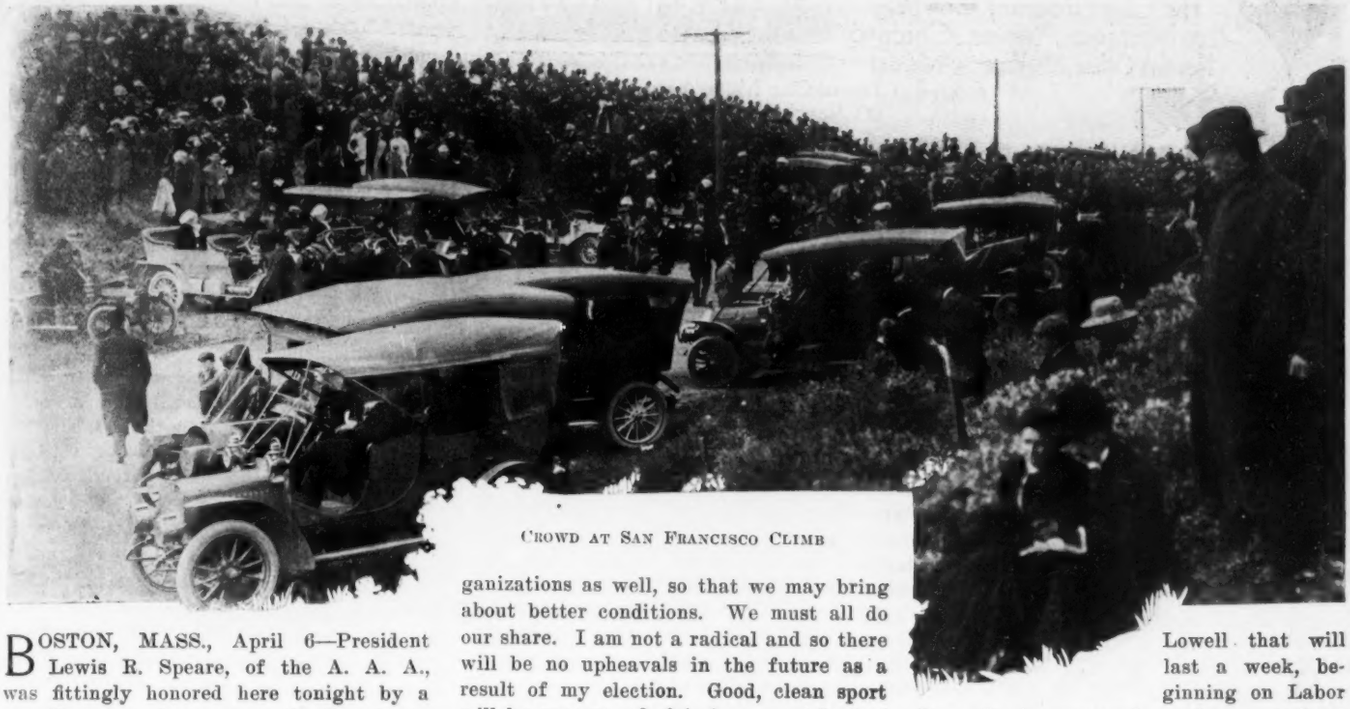
FREE-FOR-ALL

| | |
|---|---|
| Stanley, O. C. Joslyn | 1:13 3-5 |
| Comet, F. Free | 1:15 1-5 |
| White, G. Seyfried | 1:16 1-5 |
| Stearns, D. Bonney | 1:18 1-5 |
| Stoddard-Dayton, F. Wiseman | 1:19 |
| Pope-Hartford, J. Fleming | 1:20 |
| Palmer & Singer, C. Onthank | 1:20 2-5 |
| Acme six, F. Sheets | 1:24 4-5 |
| Buick, F. Murray | 1:25 3-5 |
| Rambler, L. B. Harvey | 1:31 3-5 |
| Mitchell, A. E. Hunter | 1:32 3-5 |

Special match between White steamer and Stoddard-Dayton—White steamer's time, 1:12 2-5. Declared no contest.

Exhibition—Thomas Forty, driven by I. L. de Jongh; time, 1:19 4-5.

# BOSTON HONORS THE NEW A. A. A. PRESIDENT



CROWD AT SAN FRANCISCO CLIMB

BOSTON, MASS., April 6—President Lewis R. Speare, of the A. A. A., was fittingly honored here tonight by a complimentary banquet at the Bay State A. A. tendered by his friends and fellow motorists from many places. New York sent its representatives, so did the different cities in Massachusetts where there are motor clubs, and a number of men from other New England states were also on hand.

When President Speare arose to speak he was given a great ovation. "After all that these gentlemen have said about me there does not seem any need of my arising to say a word except to thank you," he began. "But I know that you would not be satisfied with that. So I shall have to drift along on some other topic. I feel highly honored at being chosen president of the A. A. A., but not any more so than I am at this testimonial of good fellowship. Since I became identified with motoring I have ever tried to do the right thing by everyone. It was clear that what was needed to help the cause of the owners of cars was an organization, and so when one was formed and I was asked to become a member I readily did so. I felt it a privilege to join and then I tried to do my best to get others to follow my example. We all know that in union there is strength and the A. A. A. is an illustration of it. Mistakes have been made in the past. I do not say that they will not be made in the future under my administration. But what we want, and what I shall strive for all the time is harmony and co-operation. Put the mistakes down on the ledger as past accounts and let us open up new accounts that will bring honor and glory to the cause of motoring. I trust that I shall have the co-operation of all the officers, not alone of the A. A. A., but the state and local organizations as well, so that we may bring about better conditions. We must all do our share. I am not a radical and so there will be no upheavals in the future as a result of my election. Good, clean sport will be encouraged, fair laws must be had and better roads shall also be given the attention needed. That is what we should work for at all times."

President Tudor, of the Bay State Automobile Association, was unable to be present at the dinner and so Secretary Foresecue was substituted, making a most acceptable toastmaster. Mayor Hibbard also was an absentee, his secretary, James C. White, representing him. Charles Thaddeus Terry and Frank Webb, of the A. A. A., were not at the dinner, as it was expected they would be. The guests were as follows: W. H. Chase and A. A. Tisdale, Wachusett A. C., Leominster; J. P. Coghlin, Worcester A. C.; S. L. Haynes and R. A. Knight, Springfield A. C.; J. O. Heinze, Lowell A. C.; A. E. Bliss, Malden A. C.; Chairman Harold Parker, William D. Sohier, John Manning and Secretary A. B. Fletcher, the entire Massachusetts highway commission, A. G. Batchelder and Secretary F. H. Elliott, of the A. A. A., of New York; Samuel Powers, Charles J. Glidden and James C. White.

The first speaker was James H. MacAlman, of the Boston Automobile Dealers' Association, whose witty speech put everyone in good humor. Besides MacAlman and Speare, the other speakers were: J. P. Coghlin, W. H. Chase, S. L. Haynes, J. O. Heinze, J. C. Kerrison, E. A. Gilmore, Charles J. Glidden, A. E. Bliss, Harold Parker, William D. Sohier and John H. Manning.

## LOWELL CARNIVAL PLANNED

Lowell, Mass., April 5—The Lowell Automobile Club has awakened into activity this spring and its officers are now working hard to arrange for a big carnival at Lowell that will last a week, beginning on Labor Day. It is proposed to have at least two road races over the celebrated Merrimac valley course where Strang captured the Butler Ames trophy last fall. President J. O. Heinze is going about the matter in a practical manner, and at a meeting last week he outlined his plans and then arranged to have a committee appointed to interview the business men of the city relative to booming the carnival. He insisted that a guarantee fund of at least $10,000 be pledged by the business men to assure the success of the events. Permission will have to be secured from the legislature to run the races, but this should be obtained without much trouble when it is shown how successfully the last race was run without accident and that the Lowell club repaired the roads after the race. One-half the distance, and the best part of the course at that, belongs to the city, anyway, so no opposition is expected. The labor men who have parades and picnics on Labor day were inclined to object, but this has been smoothed out.

## SAVING TECHNICAL COMMITTEE

Norristown, Pa., April 5—At a meeting of the contest committee of the Norristown Automobile Club, last Saturday night, it was decided to award the first prize to the car that finishes with the fewest road penalties. Should there be two or more clean scores or ties, those cars only will be turned over to the technical committee and the one having the fewest technical demerits will get the plunder. This will obviate the loss of time which usually results from a dozen or more heavily road-penalized cars being turned over to the technical committee on the possible chance of getting through with few demerits.

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## The Motor Car Dictator

WHEN you ask a manufacturer what particular design he is going to make, quite generally the answer comes, "We are building so and so because the buyers demand it." The manufacturer is in the business for the money he makes out of it, and because of such must be credited with having good, sound business judgment in giving the people what they want, because that is what can be most readily sold at the leading price, and as such is the most profitable course, providing he has not to alter the design after a year or so because it is mechanically incorrect. A manufacturer decides to build all shaft-drive cars because the public wants them; he decides to use larger-sized wheels because the public wants them; he fits a certain type of springs because the public wants them; he builds a smaller car because the public wants it; in fact, with many car builders they are slaves to the public, securing, of course, in return the proportion of sales which their product merits.

WHAT has made the buying public such an infallible jury to daily decide on the merits of different car constructions? Is it a fact that the down-state or up-state buyer, who dictates to the factory the construction he wants, is more competent to decide such an engineering question than the designer of the car? How do 90 per cent of the buyers of cars secure their engineering knowledge regarding proper design, proper size of parts, and the desired inter-relation of same? From conversations heard in salesrooms, where the dictatorial buyer is often vastly more interested in the color of the upholstery than in the material or design of the chassis, it is a safe conclusion to make that his knowledge is frequently not based on any scientific law, in many cases it is not even empirical, and in not a few cases is based on a short catechism picked up among friends and from sundry sources.

THIS brings up the problem of the competent salesman, with which goes the accepted corollary that to be a good salesman it is not necessary to understand the mechanics of a car, it is scarcely necessary to be able to drive a car. This may be true, at least, in many cases it is true; but, such a salesman cannot be looked upon as a benefit to the industry. It frequently happens that salesmen acquiesce too readily with the demands of purchasers; in fact, some salesmen go so far as to permit of fitting any accessory, no matter how unsatisfactory it may be, simply because the buyer wants it. It is another chapter in the old story of "Give the buyer what he wants, and then he—the buyer—must bear the consequences." If the salesmen were more familiar with engineering principles, and if they were more aggressive, so that instead of immediately giving intending purchasers what they desire they could present logical and correct arguments on certain constructions, there would be less of the senseless dictation which is frequently heard from buyers and less jumping from one design to another in certain factories.

INTENDING purchasers must get their ideas on cars either from owners, would-be owners, intending purchasers, or from the factory end. Why should the dictation from the factory not be as strong, if not stronger, than from the other end? The organized factories can educate the public through the salesmen, providing the salesmen have the information and the wherewithal to impart it to the buyer. The factories cannot be the sole dictator, neither can the buyer; the factory gains its knowledge from theoretical and engineering sources, as well as from practice; in nearly all cases the buyer arrives at his conclusions from practice. One should be worth more than the other.

## Solving Taxicab Problems

TWO years ago when the word taxicab did not mean so much to the American public as it does today, utopian conceptions were formed as to the money-making possibilities of it. Some manufacturers saw in it more money than was possible with either the manufacture of standard pleasure or commercial cars. The green hill conception was not alone with the manufacturers, and not a few dealers saw in the operating of taxicab systems a mint of money, much more, and more quickly earned than in the selling business. Time changes all things, and so it is not surprising to find the attitude of many makers altered with reference to the taxicab problem and to find money interests in cities having an entirely different aspect towards the motor car livery as it existed in the taxicab. The money possibilities from both the manufacture and rent are no less attractive than they were then; in fact, they are greater, because of the growing demand and the education of the people to use them; but, in spite of this demand, many livery businesses are proving unprofitable investments, not because the people will not use taxicabs, not because this clientele refuses to pay the regular schedule of fares, but because the cost of maintenance and operation is too great for the revenues obtained.

THIS cost of maintenance, at first hand, was chiefly looked upon as a matter of tire expense, but the tire companies with commendable aggressiveness made overtures to the taxicab companies, offering to sell them tires at so much a mile, which sum was suitable to the taxicab companies, so that no longer is the taxicab condemned because of the tire expense. While the tire phase of the expenditure has been squarely and satisfactorily met, the car construction has in the majority of cases proven the white elephant. As one manager recently put it, "We don't mind buying cars, we have no complaint on the tire, we get the regular schedule, but the cost of upkeep is enormous." The cost of upkeep does not simply mean what it costs in salary to keep a couple of repairmen, who are competent to correct any trouble that may arise; this cost does not mean the amount of money paid out for the replacement of broken parts; but it does mean these two, combined with a greater third, which is the loss in revenue, due to the car, or taxicab, being off the street.

FROM such statement it would appear that the reliability of the taxicab is not equal to that of the standard five-passenger touring car of today, which, in some cases, is a fact. It is not so much a matter of lack of knowledge, of engineering principles, as it has been a lack of knowledge of the requirements of the taxicab. The cost of maintenance with some makes of taxicabs has been due to too heavy construction; in some others, it has been too much motor; and, in others, it has been a lack of flexibility. France, England and Germany have made a careful study of the taxicab problem, and the majority of the companies in these countries have come to the conclusion that taxicabs heretofore have been too powerful, too large, and too heavy. At the start, the four-cylinder cab had the big following in Paris and London, but, today, the companies are discarding them and adopting the two-cylinder and the single-cylinder types. Abroad the uniform body size has proved a pronounced advantage, but several manufacturers have been reducing the weight in many respects. The original idea that a taxicab must be as big as a limousine is fast passing away, particularly where the single-passenger schedule is adopted. By reduction in weight maintenance cost is going to be greatly reduced. Cost in maintenance can be reduced by improved design.

# OVERLAND AFTER POPE PLANT IN TOLEDO

## Indianapolis Concern Secures 40-Day Option—R. D. Apperson Now Out of the Deal

INDIANAPOLIS, IND., April 6—The Overland Automobile Co., of Indianapolis, has secured a 40-day option on the plant of the Pope Motor Car Co., Toledo, O., which plant was tentatively sold in January to eastern capitalists headed by Richard D. Apperson, of Lynchburg, Va., on the condition that the city of Toledo would put $25,000 into the sale, Mr. Apperson stating that his money was ready so soon as the city raised its share. Notices were sent out a week ago to the effect that the city was unable to meet its share and the deal was declared off. J. N. Willys, president of the Overland company, and several of the Overland directors are at present in Toledo at the old Pope plant looking over the situation. They are expected to return to Indianapolis Friday when a special meeting of the board of directors of the Overland pla t will take place for the purpose of passing on the situation. Should the Overland company purchase the Pope plant at Toledo, all of the 1910 Overlands will be manufactured in Toledo instead of Indianapolis. It is expected that the 1909 output would be manufactured in the present four factories scattered over the four quarters of Indianapolis, but that all 1910 materials ordered will be shipped direct to the Toledo plant.

The problem of securing adequate manufacturing facilities has confronted the Overland company for some time. From its small plant started in the fall of 1907, when the Overland was put on the market, expansion has gradually continued until now the manufacturing facilities are cared for in four plants. The manufacturing of an output at present ranging thirty a week from four plants can only be carried on with the greatest difficulty. For a time Indianapolis has hoped to be the future home of the Overland interests, but should this Toledo deal be consummated, it will mean a big manufacturing loss to the Indiana capital.

**Hartford Hears of Deal**

Hartford, Conn., April 6—Special telegram—It is reported here tonight that the Overland Motor Car Co., of Indianapolis, Ind., has secured a 30-day option on the Toledo plant of the Pope Mfg. Co. It is understood that if the Overland company purchases the plant it will cost in the neighborhood of $450,000 and that the Indianapolis plant also will be maintained. No details of the deal were to be had of the Pope company officials this evening.

**Argue For Tire Chains**

Albany, N. Y., April 3—At the hearing before the state highway commission Thursday motorists from all parts of the state made a strong plea against any ruling the commission might feel inclined to formulate prohibiting the use of tire chains. The hearing was held for the purpose of determining the question of regulating or absolutely barring the use of non-skids on the state highways, and to give motorists an opportunity to present their side of the case. It seems the consensus of opinion among those present that the delegation of motorists, under the direction of Charles T. Terry, chairman of the legislative board of the A. A. A., made an exceptionally strong impression, and that any action the commission may take will probably be in the nature of regulating the use of chains—confining their use to slippery wet going and prohibiting them in dry weather. The sum and substance of the motorists' plea was that it would be too dangerous to use motor cars on wet and slippery roads without non-skid chains. Assisting Chairman Terry were H. A. Meldrum, of Buffalo, president of the New York State Automobile Association; Oliver Quayle, of Albany, former president of that association, and Henry Edmund, of London, England, a member of the Institute of Civil Engineers and of the Institute of Electrical Engineers of London. Others who spoke for the retention of the chains and non-skidding devices included Peter D. Kiernan, of Albany; Edward M. McMahon, Hiram Percy Maxim, Albert R. Shattuck, James Hemstreet and C. F. Clarkson, of New York; Bert Van Tuyl, of Rochester; George C. Diehl, engineer of Erie county; John M. Bruce, of Yonkers; Frank G. Webb and H. G. Andrews, of Long Island; Arthur P. Phelps, of Watervliet; F. A. Kately, of Mount Vernon; G. H. Stillwell, of Syracuse, and F. H. Elliott, of Bronxville.

Mr. Terry made the principal argument for the retention of chain devices. He said the injury to the roads from the use of chains is slight and it was far overcome by the necessity for public safety. He declared chains were used only when necessary. "A tire chain sinks into the tire and only slightly in the roads," said Mr. Terry. "They are easily removed and are only used in wet weather. There would be no objection against a rule to prohibit the use of non-skidding devices when the road is dry, for that is the only time that they can do any damage, and motor cars then do not need them." Mr. Terry believes a prohibition against the use of tire chains in all conditions of the road would be unconstitutional.

Henry Edmund spoke, saying he had had much experience with the use of chains abroad, and that in some parts of England they were required by law. He said the effect of the chains upon the roadways abroad was less injurious than steel studded tires, which had been experimented with upon roads in England.

**After Law-Breakers**

New York, April 2—The National Highway Protective Society has been organized and incorporated. Its object is to protect the public from reckless drivers of motor cars and other vehicles by prosecuting all offenders against laws governing traffic on highways. Henry Clews is president of the society. Charles S. Whitman, formerly a city magistrate, is counsel of the society and will prosecute offenders. A considerable sum of money already has been subscribed and appeals will be made for more. The society purposes to maintain a surveillance over highways to obtain evidence against offenders through an organized corps of detectives. It will try to have laws enacted making owners of vehicles responsible for all damages, whoever may be running them. Drivers known to be reckless will be watched, and it is proposed to keep a card index of all infractions of the law whether there be an arrest or not.

**Maxwell Nears End of Test**

Boston, Mass., April 7—Special telegram—The Maxwell car in its 10,000-mile non-stop run had covered 7,872 miles up to this morning. On one of its runs to Newburyport one night last week the car ran into a chuckhole and jolted a spring so that it slipped, but it never interfered with the running of the engine. Present indications now point to the car finishing its 10,000 miles either Sunday or Monday next.

## Coming Motor Events

**Brooklyn, N. Y., Clermont rink, first annual show, Long Island Automobile Club, April 10-17.**

**Montreal, St. Lawrence hall, fourth annual show, auspices of Automobile Club of Canada, R. M. Jaffray manager, April 17-24.**

**Chattanooga, Tenn., hill-climb, Lookout Mountain Automobile Club, April 22-23-24.**

**Roadability run, Philadelphia to Atlantic City, Quaker City Motor Club, April 24.**

**Second annual carnival, New York Automobile Trade Association, April 26-May 1.**

**Second annual Fort George hill-climb, New York Automobile Trade Association, April 26.**

**Pittsburg Gazette Times-Chronicle Telegraph 3-day endurance run, April 28-30.**

**Endurance run, New York Automobile Trade Association, April 30.**

**Third annual endurance run, 700 miles, Washington, Baltimore, Scranton, Motor Club of Harrisburg, May 3-6.**

**Four-day endurance run, Detroit Automobile Dealers' Association, May 10-13.**

**Reliability run, Philadelphia to Pittsburg and return, Quaker City Motor Club, May 11-15.**

**Second annual endurance run, Norristown Automobile Club, to Hagerstown, Md., May 18-19.**

**Two-hundred-mile endurance run, Hartford Automobile Club, Hartford, Conn., May 22.**

**Third annual endurance contest, New Jersey Automobile and Motor Club, May 22.**

**Annual hill-climb, Giants' Despair mountain, Wilkesbarre Automobile Club, May 31.**

**Bridgeport, Conn., annual hill-climb, Sport hill, Automobile Club of Bridgeport.**

**Start from New York of transcontinental contest to Seattle for Alaska-Yukon-Pacific Exposition, June 1.**

# Motor Week at Cannes

DARRACQ, FIRST IN KILOMETER TRIALS

CANNES, March 21—The annual semaine de Cannes—in other words, the week of Cannes motor events—has just ended. Promoted for the first time in 1905, this annual event is increasing in popularity every year and has aided in making the city of Cannes more prosperous and better known. The first of the series of motor car events was the fuel consumption test. After having been emptied of its fuel each contestant's car was given 1 litre—1 1/20 quarts—of gasoline. The trial resulted in a sweeping victory for the 6-horsepower Peugeot, which covered 10¼ miles on the litre. An 8-horsepower Alcyon was second, having run 8.46 miles. A 6-horsepower Delage was third, covering 8.36 miles. An 8-horsepower Clement-Bayard was fourth, with 8.24 miles.

During the afternoon of the first day the brake test took place. There were twelve starters and again one of the smallest-powered cars won. The winner was an 8-horsepower Clement-Bayard, the driver of which got his car to a standstill 23.2 feet from the tape line. An 18-horsepower Peugeot was second, stopping in 24.9 feet. The 8-horsepower Alcyon came to a stop in 34.1 feet. The 20-horsepower Clement-Bayard required 1 foot more than the Alcyon.

The kilometer speed trials were held on the fine, level macadam of the boulevard Jean Hilbert. It was a flying start event and the course was lined up with a big crowd. There were fourteen starters. Ragusa, driving a 35-horsepower Darracq, was the winner, covering the kilometer in :40⅖, which is at the rate of 55.6 miles an hour. Chalandon, in a 30-horsepower Pilain, was second in :41. The 18-horsepower Peugeot, driven by Roff, which took third place, was 18⅖ seconds slower than the Pilain. The slowest time of the event was that made by Liegeard with the 6-horsepower Baby Peugeot, the time being 1:42.

The after-dinner event was a hill-climb over a course of 500 meters, followed by a slow race over the same course and distance. It was won by a 30-horsepower Pilain. An 18-horsepower Peugeot was second.

There also was a hill-climb on the Saint Jean road, combined with a starting at the signal and stopping at a signal test. This event was gone through successfully by every contesting car and for that reason no classification was made of it.

The principal prize at the annual Cannes week consists of the cup of the Automobile Club of Cannes. This trophy, worth $400, was won by Dr. Durand. In 1905 the winner was Chevalier Florio, driving a Mercedes; in 1906 M. Grigg, in a Daimler, was the winner. In 1907 and in 1908 Dr. Durand, driving a Clement-Bayard, won. This year Dr. Durand's four-cylinder car scored a total of 222 points, or forty-one more than a four-cylinder 15-horsepower Berliet. Dr. Durand's other Clement-Bayard, a 20-horsepower, was third.

## CLIMB INSTEAD OF RACE

Lyon, March 22—The Rochet-Schneider cup contest will be revived. However, instead of being a road race or endurance run it has been decided to make it a hill-climb until the manufacturers will again be sufficiently interested in road racing. The climb will take place July 7 up the Baraque hill.

DR. DURAND'S 8-HORSEPOWER CLEMENT-BAYARD

BABY PEUGEOT THAT WON ECONOMY TEST

PILAIN, A STAR AT CANNES MEET

# Queensboro~ Bridge Motor Way

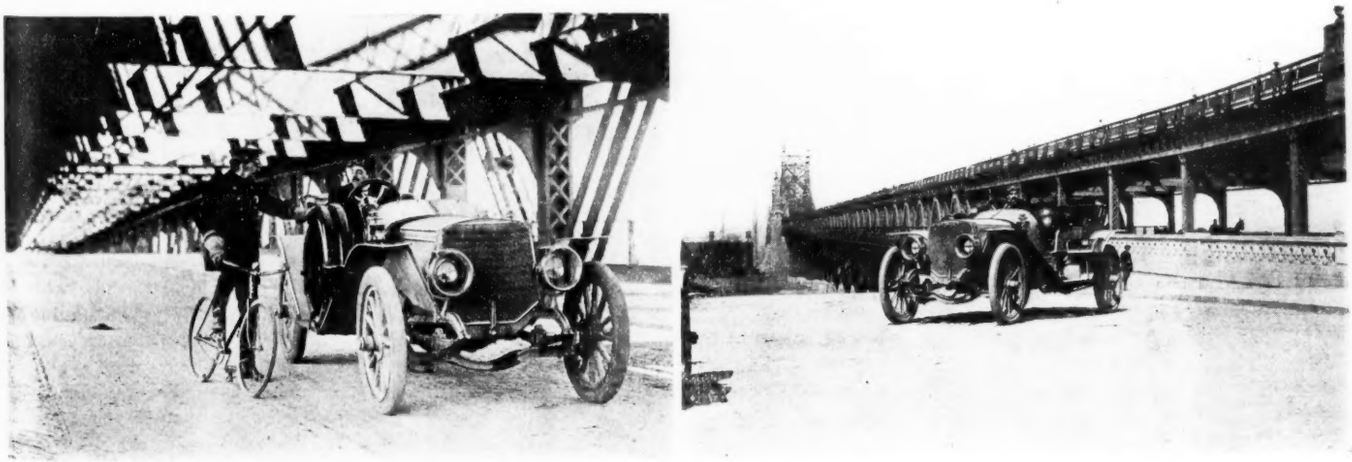
NEW YORK, April 5—Undoubtedly the new Queensboro bridge connecting New York city with Long Island is destined to become a famous motoring thoroughfare. It is the third largest cantilever bridge in the world and is the connecting link between Manhattan Island and the great highways of Long Island. It is probable that more motor cars will pass over this bridge in a day than any other thoroughfare in existence. It is a direct road between New York city and the motor parkways of Long Island and leads to the fine country estates and homes for which Long Island is noted. The bridge is 7,400 feet in length. The central portion is a wide, well-paved roadway for motor cars and other vehicular traffic. The bridge was opened unofficially Tuesday, March 30, although a special permit to use the bridge was granted to C. A. Emise, of the Lozier Motor Co., the day previous, which was used the day prior to the opening to establish a record over the bridge that will probably never be beaten now that the structure has been opened for traffic. The Briarcliff Lozier, driven by H. H. Cobe, made the length of the bridge, 14-10 miles, in less than 2 minutes, attaining a speed at the center span of 63 miles an hour. From the bridge may be seen a portion of Manhattan island with the new Metropolitan tower in the distance, this being next to the Eiffel tower the tallest structure in the world. Another view gives a glimpse of Blackwell's Island upon which rest two piers of the center span.

## NEW YORK CARNIVAL PLANS

New York, April 5—The Automobile Club of America on Saturday evening of carnival week will throw open its doors and provide an entertainment and smoker to the New York trade. On this occasion all of the various prizes and trophies won during the week will be awarded to the winning contestants. This includes the eight cash prizes amounting to $2,000, which will be given to the winners in the decorated section of the carnival parade. There will also be given out the cups and trophies won during the carnival hill-climb, endurance run, track meet and straightaway races. Colonel K. C. Pardee, chairman of the carnival hill-climb committee, announces that the hill-climb classifications and rules will be about similar.

## ENGINE PLANT FOR FLINT

Flint, Mich., April 3—Definite announcement has been made that the General Motors Co. has decided to locate its big engine plant at Flint. The contract has been let and work will be begun at once on a building 1,021 by 365 feet. The new plant will represent an investment of $1,000,000 and will be ready for occupancy in October. It will furnish employment to about 3,000 men. The plant will be devoted exclusively to the manufacture of motors for concerns controlled by the General Motors Co. During the early part of the month some of the stockholders of the General Motors Co. made a trip of inspection in their private car to the various Michigan plants controlled by the corporation. One of the announcements made was that the Olds plant at Lansing will be enlarged and that the output for 1909 will be increased 40 to 50 per cent. To accomplish this new buildings will be erected. No definite plans as to the new buildings have been given out.



LOZIER CAR THAT PARTICIPATED IN SPEED FLIGHT ON THE NEW QUEENSBORO BRIDGE

# WORKING ON THE INDIANAPOLIS SPEEDWAY

STRAIGHTAWAY AND APPROACH TO SOUTHWEST CURVE OF INDIANAPOLIS SPEEDWAY

INDIANAPOLIS, IND., April 5—Actual work on the motor speedway has been going on for 3 weeks. From a level tract of prairie land of 2 weeks ago there has sprung up a long stretch of straightaway, a gradually inclined approach and a well-banked curve. An idea of the rapidity with which the dirt is gathered may be had when one learns that the two road machines now in use are capable of gathering and dumping about 1,500 loads per day. Each wagonload contains 1¼ yards of dirt. Another complete outfit was installed this week in order that the grading might be sure of completion on scheduled time. The grounds of the speedway are a mecca for motorists of Indianapolis and nearby towns and the efforts of over a hundred men—teamsters, enginemen, foremen, engineers, struggling mules, puffing engines and dump-wagons—never cease to interest them. Nearly 4 miles of fence which it will take to enclose the grounds, an office building, a clubhouse, a two-story restaurant and other structures are also nearing completion. An interesting feature in the work of grading the course is the changing of the bed of a small creek which runs through the tract. The racing track will cross the creek twice on wide cement bridges, and to have the course cross the creek squarely instead of at an angle the engineers found it necessary to change the creek at one point near the grand stand. A small army of workmen was put to work with road scrapers and a new channel for the creek was constructed. It is anticipated that the new course will be ready for the opening early in June.

### MINNEAPOLIS CLUB ELECTION

Minneapolis, Minn., April 6—At the annual meeting of the Minneapolis Automobile Club, held last evening, there was a large attendance and great interest was shown by the members in the progress made by the organization during the past year. There has been an increase of 326 members in 12 months, the membership now being 804. During the year there has been $34,000 pass through the hands of the club officials, of which amount $20,700 went into the new country clubhouse erected at Bloomington. Four directors were chosen to fill expiring terms, and the election resulted in the selection of Dr. C. E. Dutton, George H. Seeley, Harry E. Pence and County Commissioner Frank Cook for terms of 3 years. When the four new directors had been chosen the board of directors held a meeting and chose the officers for the coming year. President Horace Lowry, who had intended to retire from that office because of pressing business, was forced to accede to the demands of his brother directors and was unanimously re-elected to succeed himself. C. F. Haglin was chosen first vice-president; S. M. Colburn second vice-president; George H. Seeley, re-elected secretary; J. H. Riheldaffer, re-elected treasurer. President Lowry then announced the following chairmen of committees:- House, Harry E. Pence; good roads, G. A. Will; sign posting, Harold Vorce; legislation, Dr. C. H. Kohler; membership, E. L. Brown; tours and contests, Dr. C. E. Dutton.

### DENVER'S GLIDDEN PLANS

Denver, Colo., April 3—While Denver will be either the official end or the turning point of the Glidden tour, the Denver Motor Club has in view a side trip to Estes Park which will give the tourists a chance to test the mountain-climbing ability of their cars and at the same time afford them an opportunity to see some of the wildest and most rugged of Colorado's mountain scenery. Should the last night stop out of Denver be at Fort Morgan, the forenoon run will be into Denver, stopping there for luncheon, and in the afternoon the run to Estes Park will be made by way of Longmount, Lyons, ending at the new hotel being built there by F. O. Stanley. This road is a steady climb nearly all the way, 4 miles being up a continuous grade of 12 per cent. The road is wide enough for two cars to go abreast and is cut out of the solid rock. The highest elevation reached is 8,000 feet, and then down again to 700 feet in the park. The following morning will be spent in the park, and in the afternoon the return trip made to Denver by way of Loveland, Fort Collins and Greeley. This route is 119 miles, but being all down grade, can easily be made in 5 hours. This would give the tourists an opportunity to see the town of Greeley, laid out by Horace Greeley, and they would pass through the famous potato and beet sugar district. This journey would also be over the trails covered by General Fremont in his early expeditions, and many historical spots would be of interest to the visitors. The Denverites are most enthusiastic over the proposition.

### ELECTRIC IN ROAD TEST

Philadelphia, Pa., April 5—One novelty in connection with the second annual road-ability run of the Quaker City Motor Club to Atlantic City, April 24, will be the appearance in the contest of a Woods electric car, entered by J. C. Bartlett, the local agent. The distance to be covered will be a trifle over 80 miles. Entries are pouring in at a rate which warrants the claim of the promoters that there will be nearly four-score cars in line. Upon the arrival of the cars at Atlantic City they will be parked on Young's ocean pier, where a miniature motor car show will be in order for Saturday night. This unique idea has had the effect of swelling the entry list, as an opportunity to exhibit cars to the class of visitors which patronizes Atlantic City in the early spring is too good to be ignored. Only those cars which compete in the run will be allowed on the pier for the exhibition.

### RACES IN ARGENTINE

Buenos Ayres, March 18—V. Laborde, driving a 15-horsepower Delaunay-Belleville, has been declared the winner of the Mar del Plata circuit, and incidentally was given $2,150, the first prize. The event consisted of two races, one for touring cars only—over a circuit of 150 miles—and the other at 373 miles, open to all kinds of cars and motor cycles. The winner was to be the contestant who having started in both races had been credited with the fastest total time for the two. In the first race there were a score of starters, among them four on motor cycles. The winner was Armada, driving a 50-horsepower Fiat, his time for the 150 miles having been 3 hours 24 minutes. Laborde, in

the Delaunay-Belleville, was a good second, only 5 minutes slower than the Fiat. Malgor, the first of the motor cyclists, was third, on a Brown, in 3 hours 38 minutes. There were nine starters in the 373-mile race. Only three finished. Dr. Roth, driving a 120-horsepower Itala racer, was the winner, having covered the course in 8 hours 6 minutes, or at an average speed of nearly 47 miles an hour. Genonceaux, in a 35-horsepower F. N., was second, in 9 hours 8 minutes, and V. Laborde, in the 15-horsepower Delaunay, was third, 3 minutes behind the F. N. man. By adding the times of both races Laborde won.

### ABSORBS PIERCE ENGINE CO.

Milwaukee, Wis., April 5—Articles of incorporation have been filed at Madison, Wis., for the Pierce Motor Co., of Racine, Wis. The capital stock is $300,000. Charles McIntosh, A. J. Pierce and Frederick Robinson are the incorporators. Mr. McIntosh and Robinson are heavily interested and at the head of the J. I. Case Threshing Machine Co. Mr. Pierce has for years been at the head of the Pierce Engine Co. The new company will take over the entire assets of the Pierce Engine Co., enlarge the plant and push the sale of the Pierce-Racine motor cars, motor boats and motors. The new company starts out under favorable circumstances—shops running with full force and on full time, with $100,000 in orders for motors, boats and cars, no liability and an ample working capital. Work on 500 cars will be started at once.

### GERMAN CLUB ACTIVITY

Berlin, March 21—Probably the most interesting announcement made during the annual meeting of the Kaiserlicher Automobil Club of Germany, which was held a few days ago, was that of Count von Sierstorpff, who stated that the club had donated $62,500 for the promotion of the Spandau motor race track.

### DEATH OF FRED JOHNSON

Philadelphia, Pa., April 5—Chairman Fred M. Johnson, of the Quaker City Motor Club contest committee, died this morning of pneumonia, after but 2 days' illness. The club holds a special meeting at noon tomorrow. Mr. Johnson's death will not interfere with the contest committee's plans for the coming season.

## Illinois Troops To Guard Two Road Races in Indiana

Chicago, April 7—Governor Marshall of Indiana today granted the request of Governor Deneen of Illinois to allow the First Regiment Illinois National Guard to enter the state of Indiana June 18 and 19 for the purpose of guarding the course while the two road races of the Chicago Automobile Club are being run, one of which is the light car race, which will be run June 18 and the other the Cobe trophy event on June 19. This, it is claimed, is the first time, barring Savannah, that the militia has been secured for police duty at American road races.

Officials of the Chicago Automobile Club have been quietly at work on this for the last 2 weeks and it was largely due to the diplomacy shown by Frank H. Trego and Harold H. Wheeler of the executive committee of the road race that this was brought about. A week ago Saturday Trego and Wheeler made a quiet trip to Indianapolis and, accompanied by H. O. Smith, R. I. Eads, Edgar Apperson, J. S. Willys and other Hoosier manufacturers, called upon Governor Marshall and petitioned for the troops. It was discovered that the Indiana militia is so scattered about the state that it would be almost impossible to get all the citizen soldiers together for the race, so it was suggested that the Illinois troops be secured. This met with the approval of the governor, after he had been shown a petition signed by the officials of Lake county, Indiana, and today the last formality was completed whereby 700 or 800 soldiers and 300 members of the signal corps of the First regiment will be available for use at the road races.

An application for a sanction has been made to Chairman Hower of the A. A. A. contest board, to whom has been submitted the papers granting the use of the roads and the soldiers.

### AGAINST A FRENCH SHOW

Paris, March 25—At a meeting of the Chambre Syndicale du Cycle et de l'Automobile, held yesterday, the show question came up for decision and by a vote of 162 to 1 out of 164 possible votes it was decided that there should be no show. Of course, this does not settle the matter, as there are still other syndicates and chambers and associations. This is the old board which has about three times as many cycle and parts and accessories members as car manufacturers. Next Saturday the Chambre Syndicale de l'Automobile et des Industries qui s'y rattachent will also take final decision about the show matter. It is predicted that it will also result in a vote against holding the show. The meeting which was held yesterday was a special one. It came about through the inner war between the for-a-show and against-a-show factions. The former had elected a new board of officers and the latter called this meeting to have the action of the old board nullified. In this the new officers roundly defeated the vote of the assembly, 121 against 43 in favor of the new officers, who are A. Darracq, president; R. Peugeot and Ducellier, vice-presidents; Pagis, secretary, and Bozier, treasurer. M. Onfray was made honorary president. It is rumored that the Chambre Syndicale du Cycle et de l'Automobile will withdraw from affiliation or membership with the Automobile Club de France and the Association Generale Automobile.

### WILL VOTE ON ROADS

Grand Rapids, Mich., April 5—Twenty-nine counties in Michigan will vote this spring on the question of coming under the state reward highway law. This means that good roads may be built by counties and townships, the state paying a part of the expense, providing the roads come up to the standard. It is probable that, with a few exceptions, the good roads question will carry in every county. In Oceana county, which is already operating under the provisions of the law, the county road commissions have recommended the raising of $6,000 for the ensuing year. In Gratiot county, which is to vote this spring, the farmers have circulated a petition asking Representative Chambers of that district to introduce a measure in the house of representatives limiting the size of loads to be drawn on the roads of the county. At Marquette a mammoth rock-crushing plant has been installed for the purpose of crushing trap rock.

WORKMEN NOW BUSY BUILDING THE INDIANAPOLIS MOTOR SPEEDWAY

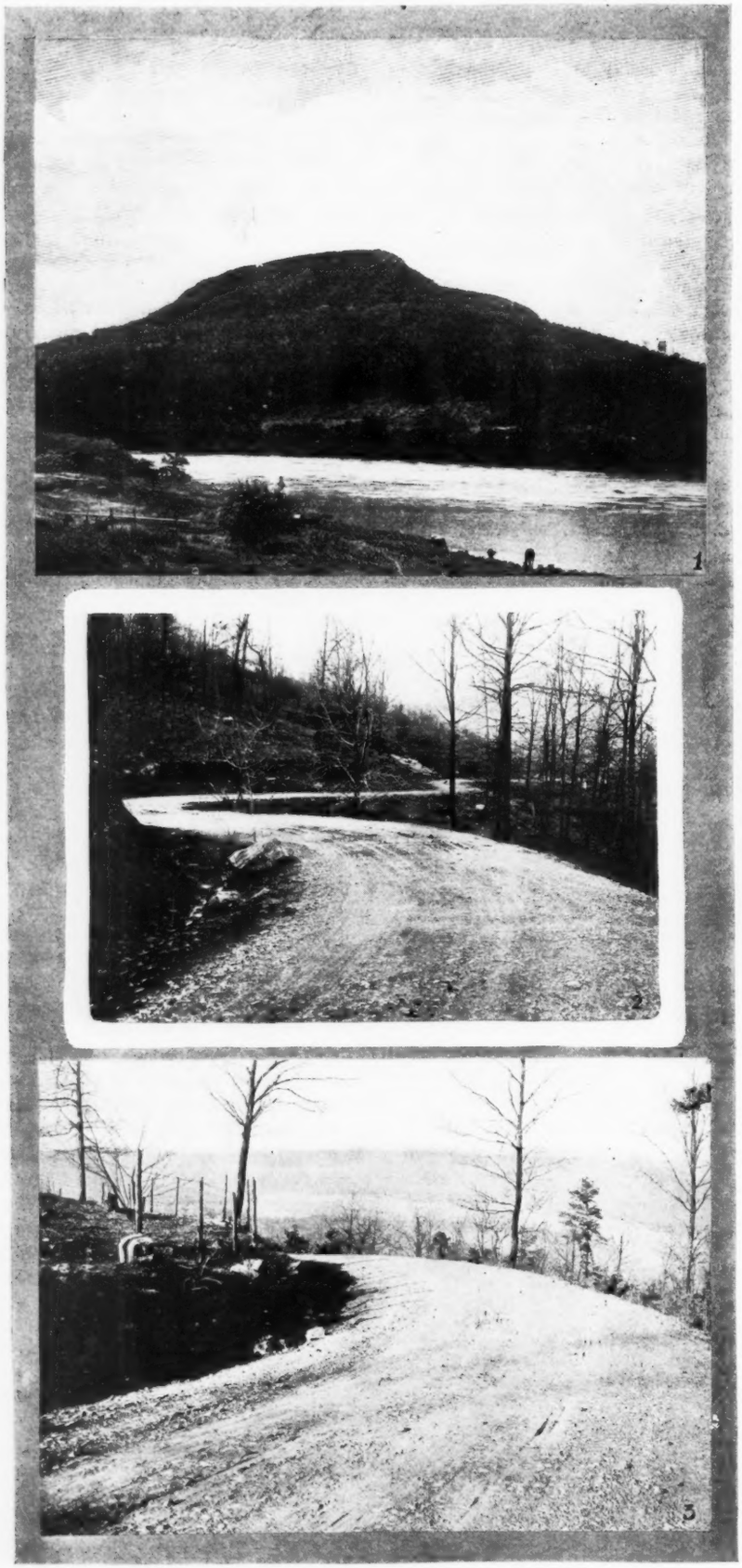
# Chattanooga Event a Mountain Test

## Tennessee Motorists Plan 3-Day Hill-Climbing Meet for April 22, 23 and 24—Troops Will Guard Course

CHATTANOOGA, Tenn., April 5.—That new and enterprising organization, the Lookout Mountain Automobile Club, is making an aggressive campaign to attract the leading cars and drivers to its mountain climb which will be held April 22, 23 and 24 and which will be one of the stiffest propositions in the climbing line that has yet been carded in this country. The club does not call it a hill-climb, dignifying it by making it a mountain contest, and mountain it is in reality—a winding, squirming road, a national pike, that runs 4½ miles from the bottom of Lookout mountain to the top, a grade that will test the power of any car. It runs 2,000 feet up in the air, the grade being about 1 in 12. The club has been most progressive in the promotion of this affair, having already secured the Twelfth United States Cavalry to guard the course for the 3 days it will be used. In addition the contest has been endorsed by the chamber of commerce, the Manufacturers' Association and other business and social organizations of Hamilton county. A mechanical timing device will be used and there will be in addition fifteen telephone stations so the progress of the climb can be followed by the spectators at the top and bottom of the hill. Each car will have a rolling start. In addition there will be a block signal service.

SHARP ASCENT TO A LITTLE BRIDGE

Six events for motor cars and two for motor cycles are carded. In the first motor car event the prize will be the C. E. James trophy. It is to be a free-for-all, with no restrictions as to weight, motor power or construction. The second class will be a free-for-all for stock cars for the W. J. Oliver trophy. The Hotel Patten trophy is hung up for the third event, which is for stock cars listing at $4,000 and under. Event No. 4 is for stock cars listing at $3,000 and under for the Chamber of Commerce trophy. Event No. 5 is for stock cars listing at $2,000 and under and the first prize is the Manufacturers' Association trophy. The Mountain City Club trophy is offered for the sixth event is for stock cars listing at $1,000 and under.



1—VIEW OF LOOKOUT MOUNTAIN FROM CHATTANOOGA
2—ROAD TAKES MANY WINDING TURNS
3—SHOWING WIDTH OF HIGHWAY TO BE USED FOR CLIMB

# Sensational Time in 16-Mile Climb

## Stoddard-Dayton Flies Up Mountain Side at Redlands, California, at the Rate of 39.6 Miles Per Hour

LOS ANGELES, CAL., April 5—Special telegram—The most sensational hill-climb ever run in the west and probably in the country took place yesterday over a grade starting from Redlands and running 16 miles to an altitude of 5,000 feet, which included 9 miles of mountain climbing. The time honors were carried off by the Stoddard-Dayton driven by Frank Seifert, which won the free-for-all in 24:12, an average of 39.6 miles per hour. In order to make this time it was necessary for the Stoddard-Dayton to travel at 60 miles an hour on the level stretches. The course is a stiff mountain grade, rather rough in places, and at points it is so narrow that only one car can pass at a time.

The Stoddard beat the Franklin by 1 minute 12 seconds, yet the air-cooler performed sensationally, Ralph Hamlin driving in daring style and making the 16-mile climb at the rate of 37.7 miles per hour. The climb was not free from accidents, there being three mishaps, none of which proved serious. The cars involved were a Kisselkar, Tourist and E-M-F. The accident to the E-M-F occurred 10 miles from the start. The car had topped a short rise and was taking a dip when the driver lost control. He claims a tire burst. The car leaped from the road, turned turtle and landed in a ditch. Summaries:

COURSE AT TIMES CUT OUT OF MOUNTAIN

CARS LISTING $500 AND UNDER

| Car | Time |
|---|---|
| Maxwell | 57:10 |
| Reo | 1:03:19 |
| Reo | 1:03:45 |

CARS LISTING FROM $501 TO $1,000

| | |
|---|---|
| Buick | 34:08 |
| Reo | 40:36 |
| Ford | 46:59 |

CARS LISTING FROM $1,000 TO $1,500

| | |
|---|---|
| Cadillac | 29:55 |
| Tourist | 34:47 |
| Chalmers-Detroit | 35:33 |

CARS LISTING FROM $1,501 TO $2,500

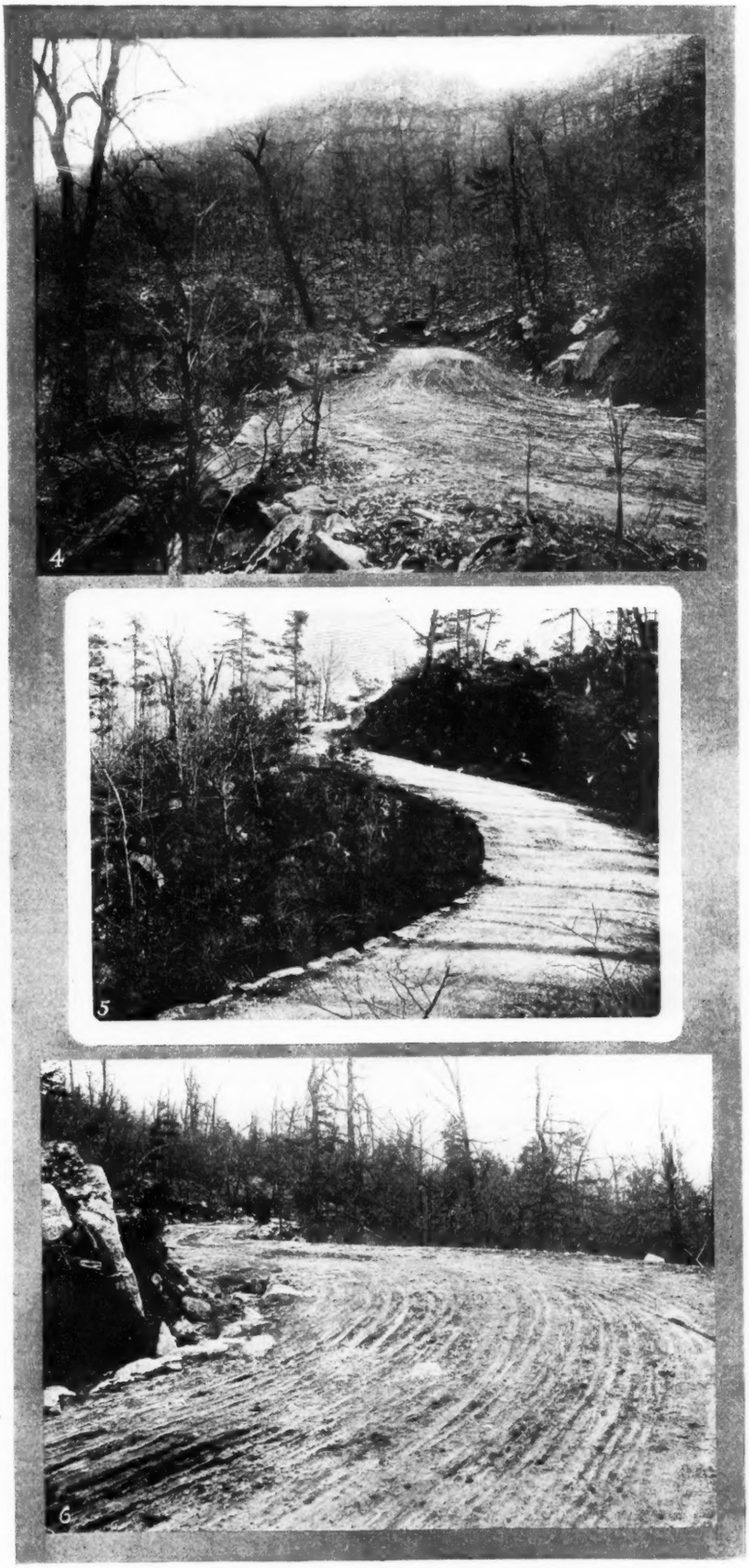
| | |
|---|---|
| Maxwell | 37:46 |
| Buick | 28:37 |
| Tourist | 40:33 |

FREE-FOR-ALL

| | |
|---|---|
| Stoddard-Dayton | 24:12 |
| Franklin | 25:24 |
| Tourist | 30:14 |

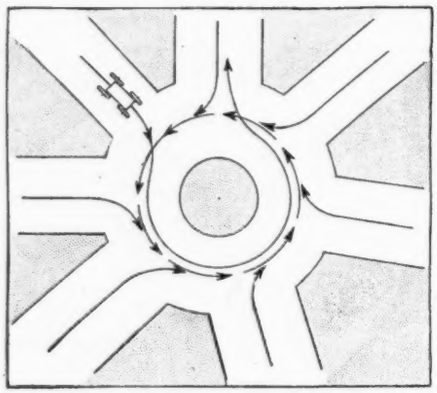
MOTOR CYCLES

| | |
|---|---|
| Excelsior | 18:05 |
| Excelsior | 20:14 |



4—WILD AND PICTURESQUE SCENERY OF LOOKOUT MOUNTAIN
5—STONE COURSE MAKES SPLENDID ROADBED FOR FAST WORK
6—CURVES ARE BROAD AND ARE EASILY NEGOTIATED

# HINTS ON CITY DRIVING FOR THE NOVICES



Columbus circle, New York, furnishes an example of the proper control of traffic. With several streets opening into the circle, no vehicle entering it is allowed to turn to the left, even if it is going only one block. In order to turn into that particular street it is necessary to go around the circle.

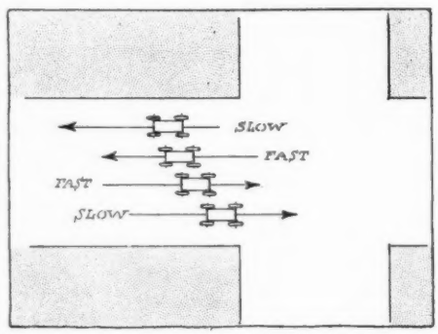
WITH the American motor industry turning out from 50,000 to 75,000 cars each year it is but natural to suppose that this means at least 25,000 or 30,000 recruits each season, and just as naturally this small army of beginners has to be taught the art of handling and driving the machines. This education generally starts with the few hurried lessons given by the demonstrator of the firm from which the car is purchased and necessarily is brief, leaving to the novice a lot to learn before he can earn his motoring degree. In general, he knows the principles of gas engine construction; what the levers are for, how to crank the motor and the lessons of the demonstrator have taught him to keep the car on the road after he once gets it going. As the new driver gains confidence so does his driving improve, and finally he begins to believe there isn't much to the art after all—it seems so easy. But this stage does not last long. Each day after his eye teeth are cut, he discovers some new point that had not struck him before until finally he becomes convinced that there is a lot to learn before one's motoring education is complete.

In large cities this point is strongly brought out because of the existing conditions where traffic is at all congested, and there's many a driver who—in Chicago, for instance—hesitates before plunging into the maelstrom inside the loop district. True, Chicago has made rapid strides in the control of traffic in the business section, but still it is far from being perfect, and one must need be somewhat proficient to go through the heart of the city without experiencing trouble or at least being scared more than once.

In operating a motor car in the city there are certain fixed rules of the road that must be observed, and rightly, too, if one is to avoid trouble, but the motto of every driver should be: "Always be prepared for everyone else doing the wrong thing." By observing that rule, the driver will find himself armed for whatever may occur on the city streets.

The first thing a new driver should do is to become familiar with the rules of the road. In some places they are unwritten rules, but in most of the big cities the police have framed up regulations for the control of traffic, which, unfortunately in most cases, apply only to motor cars, the bluecoats being singularly near-sighted when it comes to noting infractions of the rules by drivers of horse-drawn vehicles.

First on the list is the rule regarding keeping to the right. In England the traffic stays on the left side of the road, but this is the exception. It is only by everyone observing this rule that traffic can be handled in any kind of a manner, and accidents avoided. As an illustration of this point, there is a stretch in Michigan avenue, Chicago, between Randolph street on the north and Adams street on the south where this is not observed. In the center is a wide strip of Belgian block, where formerly there were street car tracks, while on each side is asphalt, and not very good asphalt, at that. It has become the custom




One of the rules of the road that the police are lax in enforcing is that which calls for slow-moving vehicles keeping as near to the curb as possible, leaving the left side of that side of the road for faster-moving rigs.

for vehicles going in both directions to go on the east side of the street, the result being all kinds of confusion and many narrow escapes from accidents. The police do not attempt to compel drivers to stay on the right side of the road here.

**Pass to the Left**

The keynote to the situation as regards the rules of the road is the obligation to pass to the left of a vehicle which is going in the same direction. Failure to do this often causes accidents, but it is noticeable on Chicago's boulevards that—even supposing expert drivers violate this clause—it's so easy to cut in between a slower-moving vehicle and the curb. Few, however, realize that in doing this they are laying themselves open to damages in case of an accident, for the other fellow has the right to swing to the right at any time he wishes, and the man getting in between him and the curb does so at his own risk just as in a race when one driver steals up along the pole and gets by in this manner. Of course, it is often hard to live up to this rule, largely because the police do not enforce the road law that slow-moving vehicles keep to the extreme right, leaving the crown of the road to those rigs which are going faster. This is particularly true in the case of electrics whose drivers generally stay in the middle of the street and run at about 8 or 10 miles an hour, which often compels others to invade forbidden territory to get by or else swing to the left directly into the path of the vehicles coming from the other direction. Cases are seen daily where drivers have had to go almost to the left curb in order to pass.

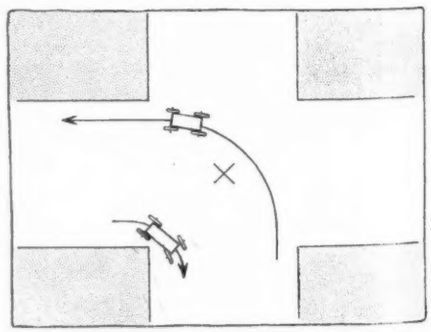
**Women Drivers Usually Careless**

Women drivers of electrics make considerable trouble on city streets largely because a woman seldom realizes there are any rules of road, and if she does she generally thinks she is exempt. Boxed in a coupe, she ambles along in a zigzag manner, first in the middle of the road, then over to the curb, serenely indifferent to the trouble she causes others. Seldom it is that she looks backward when she is about to stop or turn a corner—the others behind her have to anticipate her intentions as best they may.

Few men drivers know how to properly turn a corner, or, if they do, they do not do so. This is particularly true with the horse-drawn vehicles, whose drivers take the turns as if no other rigs were on the street. The violators of this rule generally start to turn before they reach the street, cutting diagonally across the street, obstructing traffic coming from the other direction, and when they do make the swing—supposing it is to the left—they hug the left-hand corner, whereas they should pass the middle of the street intersection before turning, then keep as close to the right-hand curb as possible.

**Boston's Road Regulations**

Boston recently adopted a set of road rules which has been found to work well in practice. Those clauses which pertain to vehicles in motion are particularly clear and reasonable, and are as follows:



In turning corners the driver of a vehicle turning to the left from the right hand side should pass the center of the street intersection before making a turn. In case he is seeking to make a right hand turn he should hug the curb as closely as possible in turning the corner.

A vehicle, except when passing a vehicle ahead, shall keep to the right and as near the right curb as possible.

A vehicle meeting another vehicle shall pass on the right.

A vehicle overtaking another vehicle shall, in passing, keep to the left, but it shall not leave the line on the right unless there is a clear way of at least 100 feet in advance on the left.

On a highway divided longitudinally by a parkway, viaduct, walk, sunken way or subway structure, vehicles shall keep to the right of such division.

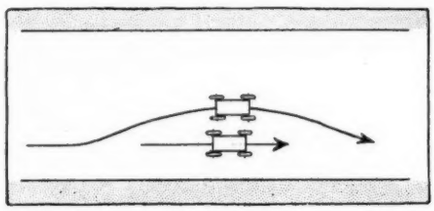
A vehicle in turning to the right into another street shall keep as near to the right curb as possible.

A vehicle turning to the left into another street shall pass to the right of and beyond the center of the intersecting street before turning.

A vehicle crossing from one side of the street to the other shall do so by turning to the left so as to head in the general direction of traffic on that side of the street.

Slow-moving vehicles shall keep as closely as possible to the curb on the right, so as to allow faster moving vehicles free passage on the left.

No persons having charge of a vehicle shall allow the same to come within 10 feet of any



Never pass to the right of a vehicle going in the same direction. If you do you do it on your own responsibility and you have no recourse in case of an accident caused by the other driver turning in to the curb. Always go to the left and be sure you are well ahead before attempting to swing back into your original line.

vehicle in front of him when approaching and passing over a crossing where a pedestrian is about to pass.

No person shall drive, guide or have the care of two or more horses harnessed respectively to different vehicles.

Every driver of a vehicle shall, in slowing up or stopping, give a signal to those behind by raising a whip or hand vertically.

In turning while in motion or in starting to turn from a standstill a signal shall be given by the driver of the vehicle about to be turned by raising a whip or hand, indicating the direction in which the turn is to be made.

Before backing ample warning shall be given by voice or uplifted hand, and while backing unceasing vigilance must be exercised by the driver not to injure those behind.

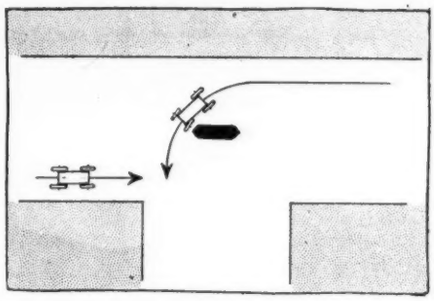
Drivers of motor vehicles of all kinds shall in approaching a crossing or in rounding a corner or curve of a public street sound their signals in such a way as to give warning to other vehicles and to pedestrians of their approach.

Vehicles must stop so as not to interfere with or prevent the passage of pedestrians at crossings, and at all times drivers of vehicles must stop the same on a signal from a police officer.

**Etiquette of the Road.**

The first duty of the new motorist is to familiarize himself with such rules. He should start in right by living up to the etiquette of the road. It's a case of "do unto others as you would be done by," and, while the temptation is great to cut corners, turn in the middle of block, stop on the wrong side of the street, and possibly violate the speed laws; still, it is only by everyone trying to avoid doing these things that the traffic of a big city can be handled properly.

Chicago has only recently attempted to regulate traffic in the loop district, but already the bluecoats have succeeded in bringing a semblance to order out of chaos. At each of the down town corners are located two, and sometimes four, policemen. One of these is in control of the squad, and he blows the whistle that regulates the ebb and flow of the vehicles. One

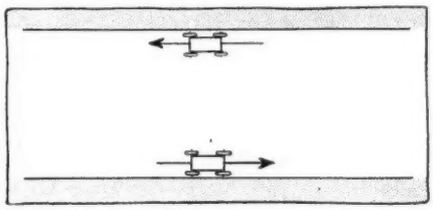


Confusion is sometimes caused in turning around the pedestrian refuges, such as are found in Chicago—at Michigan avenue and Jackson street, for instance. Here drivers should use signals, a wave of the hand to the right asking the other driver to pause, while one to the left gives the other fellow the right of way.

blast means that the teams going north or south shall proceed, while two permit the east and west bound rigs to proceed on their way. The officers are very strict and show great impartiality, making no distinctions between the motor cars and the horse-drawn vehicles. The chief complaint against the system, though, is that no attempt is made to control the pedestrians, the result being that the driver of a rig that has been given the signal to go ahead often finds his way blocked by the people on foot who run ahead of him and take chances. When this is remedied by making the pedestrians wait just as do the rigs, then the system will be perfected.

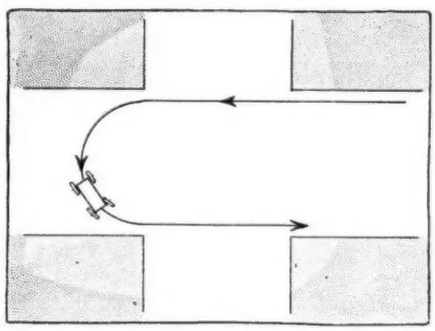
**Signals Are Used**

Having learned this lesson, the new motorist then should study the signals com-



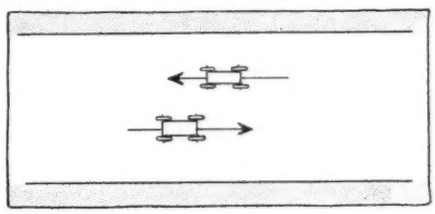
Never stop at the curb with the car facing in the wrong direction. The rules of the road call for a machine or vehicle stopping with the right wheels to the curb. It is a good idea and one of the few that is generally observed—with motor car drivers at least.

monly used. He should know that when the driver of the rig ahead raises a hand or whip it means that he is about to turn a corner, or maybe he is going to stop. Few of the horse drivers do this, but still there are exceptions. If all did so, then there would be fewer accidents. As laid



A good rule to observe and one that will prevent accidents is always to go to the next corner before turning in a street. The turn should not be attempted until the farther corner has been reached, then a wide swing should be made, caution being observed, of course, to avoid rigs going in both directions.

down by the makers of road rules, the right arm extended means that it is unsafe for the man behind to come up on that particular side, because the signaler is preparing to turn a corner and needs the sea room. The arm extended to the left means caution on that side. The right arm raised so the arm is above the level of the head, with the forearm vertical and the shoulder portion horizontal, means that speed is about to be slackened, possibly because of the traffic or because of some maneuver the driver wishes to make. It may be a case of reverse; then the horn should be sounded to call attention to the signal. Another signal that is sometimes used when a driver desires the car behind to pass him or he has consented to give the right of way is to hold the right arm down-



When two cars meet going in opposite directions the safe way for each driver to do is to keep well to the right of the crown of the road, thus avoiding the possibility of a collision.

ward outside the body of the car, and wave it forward.

The motoring novice also can profit by studying the methods of others in passing street cars, which are a source of great danger because so many passengers alight without even thinking of looking around to see if a motor car, or even a horse-drawn rig, is approaching. Therefore, it behooves the driver to exercise great caution. When he sees a street car has stopped, then it is wise to slow immediately, and if necessary come to a full stop until the road is cleared. Chicago has had a couple of fatalities caused by taxicabs hitting people alighting from street cars, and now a suggestion is made that it be compulsory for a vehicle overtaking a street car to pass on the left side instead of between the curb and the car. This sounds like a sensible idea and is but carrying out one of the fundamental rules of the road.

**Care at Street Crossings**

Great care should be exercised approaching street crossings, and the wise driver will always have his car under perfect control and with the speed cut down, for he never knows but what some other rig is coming from the other direction, the driver of which may not be as careful as he might be, which would make a collision possible. Then, too, pedestrians are careless in crossing the street, and they have to be looked out for. This street crossing proposition has become a serious one, and already some of the radical law-makers are suggesting that motor cars be compelled to come to a full stop at each crossing just as do the street cars. Happily, no city has as yet undertaken to put such an idea into execution.

# The Readers' Clearing House

**EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems, and invites the discussion of pertinent subjects. Correspondence is solicited from subscribers and others. All communications must be properly signed, and should the writer not wish his name to appear, he may use any nom de plume desired.**

## THE HOLSMAN MOTOR

EDITOR MOTOR AGE—I understand that the engine of the Holsman motor buggy uses an eccentric instead of a crank. Am I right? What advantage does the company claim for this? Will Motor Age tell me where I can secure route maps showing routes to Yellowstone Park from points in the western states?—A Continual Reader.

In the new four-cylinder four-cycle air-cooled Holsman motor, the crankshaft has two eccentric disks instead of throws. This is not new in crankshaft construction in that the Darracq and one or two other concerns building six-cylinder motors have used disks instead of offsets for carrying the crankpins. In the Holsman motor there are but two eccentrics for the four pistons. The cylinders are arranged in pairs, two on opposite sides of the crankshaft, and the pistons in opposite cylinders are fastened together as one, and where they unite is a roller bearing fitting over the eccentric on the crankshaft. This construction eliminates connecting rods entirely, and greatly simplifies crankshaft construction. The only route maps, by which the Yellowstone might be reached from western states, are those issued by the Glasson Map Co., Denver, Colo.

## WHO MAKES SPRING MOTORS?

Clifton, Ill.—Editor Motor Age—Through the Readers' Clearing House will Motor Age inform me who manufactures spring motors and if they are a success?—Henry Christensen.

Motor Age is unable to give you any information on motors of this nature which can be used on motor cars, and would be glad to hear from any of its readers on the subject.

## WORLD'S RECORDS

Roswell, N. Mex.—Editor Motor Age—Through the Readers' Clearing House will Motor Age answer the following questions: What is the world's record for motor cars, both gasoline and steam? When, where, by whom, and by what car was it made? Give records for 1, 2 and 5 miles; also the fastest time on ½ and 1-mile circular tracks.—C. W. Maxwell.

Your questions regarding speed records are somewhat vague as you do not specify distances in your first one. The fastest time for 1, 2 and 5 miles has been made on the sand beach at Ormond. In 1906 Fred Marriott, driving a 50-horsepower Stanley steamer, did 1 mile in :28 1-5. At the same meet and in a race with the Stanley, Victor Demeogeot, in a 200-horsepower eight-cylinder Darracq, did 2 miles in :58 4-5. In the same tournament Hemery in the 200-horsepower Darracq, turned 5 miles in 2:34. All of these were straightaway records. The 1-mile record on a circular track is :51, made last year by Ralph de Palma in a Fiat at Minneapolis. The 2-mile record is credited to Barney Oldfield in a 60-horsepower Peerless, made in 1:46 2-5 at Los Angeles, December 21, 1904. The American Automobile Association does not recognize records made on ½-mile tracks.

## USING MOTOR AS BRAKE

Lebanon, Pa.—Editor Motor Age—The question often arises, "What is the proper thing to do in descending a hill with a motor car—to leave the car on high speed, or shift back into low?" Some argue, very emphatically, that one should shift to low gear, which will prevent the car from going faster than that gear is rated, provided the ignition is cut out and compression used as a braking means. My contention is that the greater resistance is on the high gear and with ignition cut out one can break the speed of the car more successfully than on low gear. I control my car altogether with the foot brake and compression of motor, and shift on high gear, never using the emergency brake unless compelled to stop on descending a very steep hill, or when I stop and leave the car standing. I believe there are more tires ruined and brakes worn out by the foolish use of the emergency brake than by any other means. If the car is declutched, by a gentle application of the foot brake it can be stopped very quickly without injury to either brake or tires. The same applies in descending a hill. The proper time to control the speed of a car is at the top of the hill. If a car is allowed to shoot down a hill, why, then, one certainly will be obliged to use all the brakes at his command, and then the car will get the better of the driver and run away. But if a car is left on high gear with ignition cut out and the throttle closed, which is necessary to prevent the engine taking in a charge, and the charge allowed to go into the muffler and after reaching the bottom of the hill the switch is put on, it will be found the engine will start at once. The first explosion may result disastrously to the muffler. By operating a car in this way much fuel can be saved and the engine cooled at the same time.—J. H. Cilley.

You get greater braking efficiency on the motor by shifting into low gear. If the car is geared three to one direct, the efficiency on low gear is three times as great as it would be on direct. This may be explained as follows: If the car uses 36-inch wheels each revolution of these wheels takes the car 113 inches down the hill. On direct drive the motor will revolve three times in this distance, if the gear ratio is three to one. If the ratio on low speed is nine to one, the motor will turn over nine times in making this 113 inches of descent on the hill. Say the motor has a cold compression of 70 pounds in each of its four cylinders. On direct drive there will be six compression strokes, which furnish the braking power; whereas, on indirect drive there would be eighteen compression strokes. The braking power of each compression stroke is the same, so that on indirect drive with these gear ratios the braking is three times as efficient in one case as in the other. There is still another factor which aids in braking on indirect drive, namely, the friction of the gearset. With the gearset showing a loss of efficiency of 20 to 25 per cent there would be a corresponding increase in the braking power.

## PROPER GASOLINE GRADE

Cincinnati, O.—Editor Motor Age—I have a four-cylinder Blomstrom 30 and desire to get more power out of it. Will Motor Age inform me what gasoline would be better to use—68 or 72 point?—Reader.

Seventy-two point gasoline will prove more satisfactory than 68, and it will also be more expensive. With a 72, the motor will start much more readily in cold weather and there will be fewer gasoline troubles with it.

## WIRING A WILSON MAGNETO

West Liberty, Ia.—Editor Motor Age—I have a Wilson magneto with a coil, which I think is an ordinary step-up transformer, and I want to use it on my two-cylinder opposed engine, but do not know how to wire it. Will Motor Age through the Readers' Clearing House tell me how to wire such an outfit? I have written the Drake people, who put this magneto on the market, but the letter was returned to me, so I judge they have gone out of business. The magneto appears to be a good one, has six magnets and a six-pole armature, with a low-tension spark, and with current applied through the coil gives a good jump spark. There is no distributer and judging from its make-up I do not think there ever was one with it.—V. R. Lane.

The Drake company which manufactured this magneto is out of business now. The wiring of this system outlined in your communication is as follows: The mag-

neto being a low-tension, alternating generator with six windings on the armature and traveling at twice the speed of the crankshaft gives twelve alternations per revolution. The current is taken from the armature to one of the primaries on the coil, and from the other primary of the coil a wire leads to the sixth. The second wire from the magneto is grounded, as is one of the secondaries from the coil. The other secondary from the coil leads to the center of the distributer, and from the four secondary terminals of the distributer high-tension cables reach to the plugs. From the switch a wire leads to the primary in the distributer, and all of the four primaries are connected together. Motor Age is not able to secure a diagram because of the impossibility of getting an outfit from which to make the illustration.

### WIRING SIDE AND TAIL LAMP

Chicago—Editor Motor Age—Through the Readers' Clearing House will Motor Age tell me how to wire side and tail lamps, also speedometer light to a Remy magneto, the lights to be lighted when engine is running, and with a throw switch to storage battery when engine is still? What candle power should the lights have. If space permits, kindly draw diagram of wiring.—Dr. F. R. Merz.

Owing to the high voltage generated from a magneto it is not practical to have the amperage output that would run one or more lamps. The amperage output of the magneto is so small that it would not burn a lamp of even a low voltage. All that is necessary in a magneto is to get a hot spark and the high voltage gives this.

### MYSTERY OF SPARK PLUG

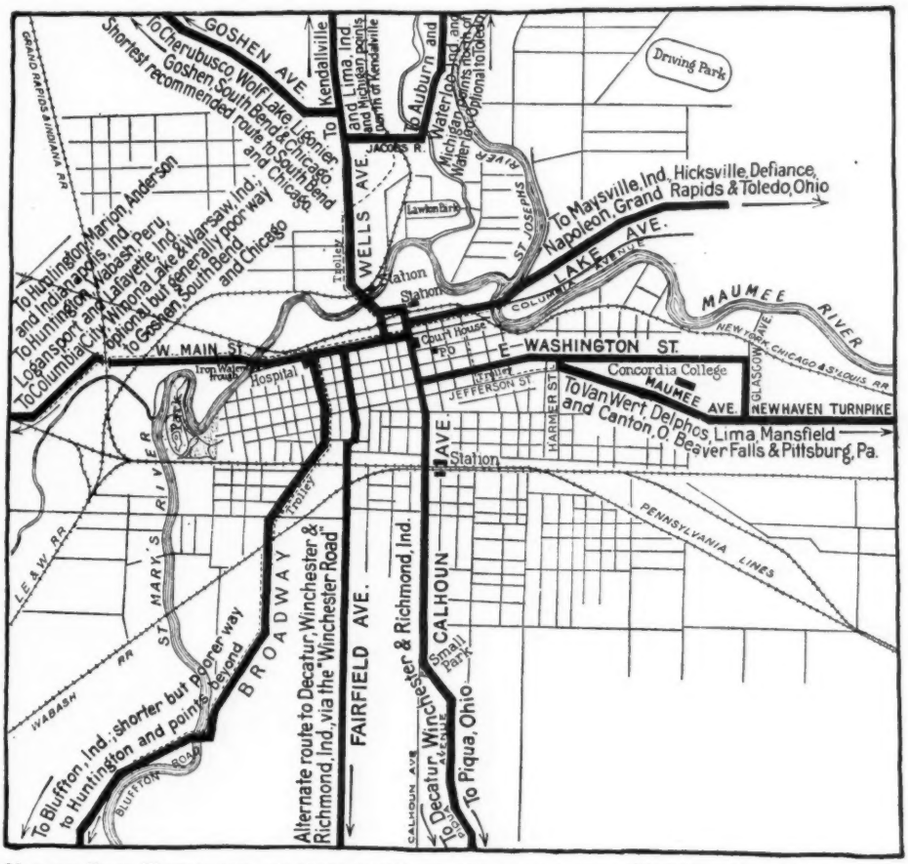
New Orleans, La.—Editor Motor Age—While demonstrating the two-spot spark plug I was informed by an interested spectator that he had used such plugs and did not approve of them. When I asked him to state his reasons why he did not like them he said that when the engine got hot it would run even with the switches shut off. He could offer no explanation why the two-spot kept on sparking, and I was unable to convince him that the spark was jumping nevertheless. The spectator said that he had been told by a professor that the two-spot spark plug acted in that manner when it was hot. Will Motor Age inform me how this spark obtained its fuse and how the professor could see the spark sparking so that he knew it was sparking all right? Kindly explain the operation of the Knight motor. Is it a valveless motor and how do the valves operate without cams?—J. J. MacMann.

What do you mean by the two-spot spark plug? Is that the name of a certain style of plug or do you refer to a plug with double electrodes and where the spark has an opportunity of two, three or four gaps, it bridging the one with least resistance. The Knight motor was described and illustrated in Motor Age October 1, 1908, pages 28 and 29. This motor has no valves but openings in the cylinder walls, the opening on one side of the cylinder to admit mixture and on the other side to permit exhaust gases to escape. These openings are covered and uncovered by two reciprocating sleeves which travel between the cylinder wall and the piston. In these sleeves are openings located to register with the intake port in the cylinder on the suction stroke and with the exhaust port on the exhaust stroke. These sleeves are driven from an eccentric shaft, which is driven by silent chain from the crankshaft.

### WINDING MAGNETO ARMATURE

Minneapolis, Minn.—Editor Motor Age—I want to change a Perfection direct current to a hightension magneto. I am following the construction of the Bosch type for single-cylinder motor cycles and have made patterns for the shuttle and core pieces. How should I start to wind the armature, what paper should I use on the core, also what size wire for primary and secondary winding? How many windings of primary are required, and what amount of wire is needed? How is a condenser made and of what material? Is there a book published giving detailed information on up-to-date magneto construction?—A Subscriber.

As to the size of wire to use in winding the armature, much depends on the amount of current you expect to get from the magneto. It is customary to use 20 or 40 size for a primary. A No. 15 B. & S. gauge winding can be made suitable for battery or magneto work. In an armature with double windings the primary could be No. 22 wire and the secondary No. 36. The first thing is to insulate the core. The inner end of the wire is soldered to the core and then pieces of muslin slipped over the core, these being cut so as to form a complete covering. With the muslin in place it must be secured with thread, after which it is shellacked. In winding it is best to put the armature in a lathe, and the wire is wound as smoothly as possible in layers like thread on a spool. It is best at intervals to stop winding and hammer the partially complete coil first by means of a block of wood and a light hammer. When the coil is completed, twist the outer end two or three times around the next wire to prevent it being thrown out by centrifugal force. This done, the whole coil is bound with hard brass wire wound into a shallow groove, turned in the armature poles for that purpose. The binding wires must be drawn as tight as possible. A condenser is made with alternations of tin foil and certain grade of oiled paper. In general, these are cut in lengths 12 or 16 inches and 5 inches in width. A strip of the paper is laid on the table, on top of it is a strip of tinfoil, projecting a little beyond at one end of the paper. Over this is another strip of paper, followed by a strip of tin foil projecting beyond the paper at the opposite end to the first strip of tin foil. This work is continued, putting on


GOSHEN AVE.
To Cherubusco, Wolf Lake, Lisonier Goshen, South Bend & Chicago. Shortest recommended route to South Bend and Chicago
To Kendallville
To Auburn and
Driving Park
Michigan Trains meet at Optional to Toledo
Waterloo and
To Maysville, Ind. Hicksville, Defiance, Napoleon, Grand Rapids & Toledo, Ohio
LAKE AVE.
WELLS AVE.
JACOBS R.
Lawton Park
ST. JOSEPHS RIVER
Station
To Huntington, Marion, Anderson and Indianapolis, Ind.
To Huntington, Wabash, Peru, Logansport and Lafayette, Ind.
To Columbia City, Winona Lake & Warsaw, Ind., Optional, but generally poor way to Goshen, South Bend and Chicago
W. MAIN ST.
Court House
P.O.
E. WASHINGTON ST.
MAUMEE RIVER
NEW YORK, CHICAGO & ST. LOUIS R.R.
Concordia College
JEFFERSON ST.
MAUMEE AVE.
GLASCOW AVE.
NEW HAVEN TURNPIKE
To Van Wert, Delphos, Lima, Mansfield and Canton, O. Beaver Falls & Pittsburg, Pa.
Hospital
Iron Water Trough
Park
HARMER ST.
JAVE.
Station
PENNSYLVANIA LINES
L.E. & W. R.R.
ST. MARY'S RIVER
Trolley
BROADWAY
FAIRFIELD AVE.
CALHOUN AVE.
Small Park
To Decatur, Winchester & Richmond, Ind.
To Piqua, Ohio
WABASH R.R.
To Bluffton, Ind.; shorter but poorer way to Huntington and points beyond
BLUFFTON ROAD
Alternate route to Decatur, Winchester & Richmond, Ind. via the "Winchester Road"
GRAND RAPIDS & INDIANA R.R.

MAP OF FORT WAYNE, IND., CORRESPONDING TO DIRECTIONS FOR ENTERING AND LEAVING THE CITY BY ROUTES NOW BEING COMPILED FOR WESTERN EDITION OF THE AUTOMOBILE BLUE BOOK

the necessary layers of paper and tin foil according to the capacity of the condenser. This done, the whole is folded into convenient form and the ends of one series of tin foil strips clamped between the folds of a copper strip to which attaches a short wire. A similar copper strip of wire serves to connect all of the alternate strips of tin foil. The condenser can then be wrapped, after which it is ready to be placed in the coil box. A condenser resembles very much a multiple-disk clutch, the alternate sets of disks being the two series of tin foils. Between the clutch disks is a film of oil, but between the series of tin foils in the condenser are the strips of paper used for insulation.

## MIDLAND INTERLOCKING SYSTEM

Moline, Ill.—Editor Motor Age—In a description of the Midland car, recently published in Motor Age, a slight misconception was given in connection with the interlocking system in conjunction with the gearset. This system is illustrated in Fig. 1. The lever L is for changing speeds, and as soon as it is moved to one side of the center of the gate G, the plunger P, which floats in the hand lever L by its ends resting upon the lower ends of the arms L2 and L1, locks the upper end of the arms L2 and L1 opposite the one against which the lever L is pressing to pick up the gear, thus establishing an interlock before the lever L is entirely out of the gate. It is understood that the lever L1 attaches to the sleeve; whereas, the lever L2 leads direct to the shaft S. This interlock is entirely mechanical, the spring W at the bottom being merely to center the lever L.—H. E. Walton.

## CLEANING SCHEBLER CARBURETER

Parkston, So. Dak.—Editor Motor Age—Through the Readers' Clearing House will Motor Age inform me where I can secure complete instructions for adjusting and cleaning a Schebler carbureter; also, where I can purchase a book on the care and operation of a motor car and how to remedy troubles that frequently arise on the road?—Reader.

Complete instructions on the adjusting and cleaning of a Schebler carbureter may be obtained by communicating direct with Wheeler & Schebler, Indianapolis, Ind., who manufacture it. The Class Journal Co., 1200 Michigan avenue, Chicago, sells numerous books dealing with how to remedy troubles which arise in connection with motor cars. Concerning cleaning the Schebler carbureter the only necessity would be because of the accumulation of dirt which may get beneath the needle valve controlling the entrance of gasoline into the float chamber, and so preventing the proper seating of this valve. The presence of dirt at this point can be located by removing the nut or cap forming the cover to the needle valve chamber and tapping gently on the top of the valve to discover if it seats properly. Frequently

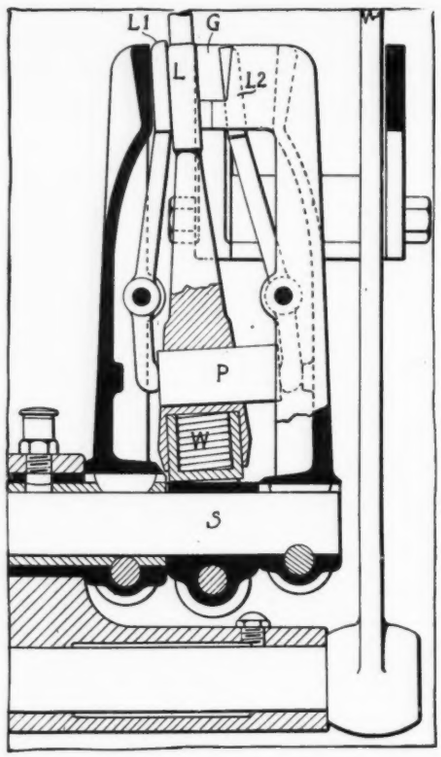



FIG. 1—MIDLAND INTERLOCKER

sediment will collect in the bottom of the float chamber and this can be removed by taking out the petcock in the bottom of the float chamber. The Schebler carbureter can be adjusted as follows: For low speeds, close the throttle as nearly shut as possible and gradually screw the needle valve down until the motor starts missing, and then back just until missing ceases; this will give a suitable adjustment for this speed. For high speed, move the gasoline adjustment to give a reasonable lift to the needle valve and open the throttle. If the motor is missing the tension on the auxiliary air valve spring may be too slight and increasing it will permit the air valve to open later, thereby increasing the gasoline percentage in the mixture. Should the mixture prove too rich on high speeds, slacken the auxiliary air valve spring. In addition to the adjustment made possible by the auxiliary air valve springs, are the two adjustments on the gasoline needle valve in the nozzle—one for intermediate speeds and one for high speeds, and the adjustment of these must be proportioned with that of the auxiliary air valve spring.

## LOCATING KNOCK IN MOROR

Bushnell, Ill.—Editor Motor Age—Through the Readers' Clearing House will Motor Age, or some of its readers, tell me how to remedy the trouble I am having with my two-cylinder car, which knocks badly when running, standing still or pulling? I have had the engine down and thoroughly cleaned of all carbon deposits, tightened all boxes, and, in fact, done everything apparently to eliminate the difficulty.—Subscriber

Granted that all your bearings are tight, we suggest a number of other causes for knocks, hoping that you may find the cause of your trouble among them. First endeavor to locate the knock by sounding: Take a long, round file with a wooden handle, or piece of broom handle, place one end on or near the various seats of trouble mentioned below, and apply the other end to the ear. In this way you may be able to quickly locate the source of the pound, or at any rate you will be able to note in which part of the motor the knock occurs. Pre-ignition will cause a knock that will be just as audible without a sounder as with one. This may be caused by an advanced spark; a fin or small projection probably hidden in one of the valve ports which becomes incandescent, thereby igniting the gas before the piston has reached the top center; improper valve seating, which will allow a flame from one cylinder to pre-ignite the gas of the other—the valve may be warped, or if adjustable, the adjustment may be holding the valve open a trifle; or the revolving contact or a control lever of the timer may be out of adjustment. If the crankshaft is not perfectly at right angles to the connecting rod, the crankshaft and flywheel will travel sideways so as to strike the crankshaft bearings on one side or the other. A flywheel that is loose on its shaft will also cause a pound. A loose timing gear will cause trouble if it is loose on the shaft; and if a chip of some solid substance gets jammed between the teeth of a gear, a loud knock will often be heard. Find out how often the knock occurs in comparison to the number of revolutions of the motor; this may aid you in locating the trouble.

## CARBURETOR DIFFICULTIES

Weyauwega, Wis.—Editor Motor Age—I have a model 10 Buick which is giving me considerable trouble and on which a Kingston carbureter is fitted. I have cleaned out the tank and pipe leading to the carbureter, put in new set of six cells. The engine misses badly. I have raised and lowered the float; at times, it fires in the carbureter. The motor will run all right on any two, three or one cylinder, but as soon as I give it the work of four it misses. Ignition seems all right. The timer consists of a distributer and commutator. What is the action of such a timer? The plugs spark is good. In my own mind the trouble is in the carbureter, but I have been unable to locate it. The other day I started the motor after it had stood one hour, and with the first turn of the crank it blew the muffler to pieces.—H. G.

It is difficult to explain the reason of the missing in your car. Many cases of this nature have been heard of from time to time, and Buick repair men have been unable to satisfactorily correct the trouble without fitting a new carbureter. The missing has been in not a few cases noticed when the car was required to make a

good stiff pull. Backfiring in a carbureter would indicate carbon or some other substance on the seat of an intake valve, thereby preventing its seating properly, and allowing some of the flame at the time of ignition shooting in the intake pipe and igniting the mixture in the carbureter. The muffler explosion was naturally due to it being filled with explosive mixture, which was ignited by the hot flame from the exhaust. It might be of benefit if you would examine the seating of the exhaust valves to see if they are free from carbon and also to test the springs to determine if they are sufficiently strong to insure their seating properly. It sometimes happens that considerable missing occurs if these springs are too weak. An easy way, however, to determine if this is the case is to insert a screwdriver or some other similar piece between the coils of the valve springs, thereby increasing their tension and which should stop the missing if it is due to this cause.

### SUMMER CARE OF BATTERIES

Louisville, Ky.—Editor Motor Age—Through the Readers' Clearing House will Motor Age state if storage batteries, such as the Witherbee, deteriorate when not in use? I have two cars—a limousine and a touring car—and wish to place the former in storage during the summer months, but have been told that storage batteries are injured by not being used. If such is the fact, what precaution can I take to protect them during the time car is not in use?—Subscriber.

It is bad policy to leave storage batteries in an uncharged condition. When not in use they should be kept charged, the charging taking place at least once in every six weeks. At such times the electrolyte should be replenished so that it will always be a fraction of an inch above the plates. A volt meter must be used in testing the strength of storage cells. It is best to have the battery charged to its full capacity when the car is stored and then recharged regularly as stated.

### FORMULA FOR OXIDIZING

Humboldt, Ia.—Editor Motor Age—Will Motor Age give me a formula for finishing brass motor car lamps in nickel oxidized effect, or black nickel. Also for bronzing brass a dark chestnut brown which will not tarnish.—A Subscriber.

The following solution will deposit a coating of nickel which will be a deep velvety black and equally as hard and as thick as the ordinary nickel plating: Double sulphate of nickel acid, 12 parts; aqua ammonia, 16 parts; carbonate of ammonia, 2 parts; arsenic, 2 parts; cyanide of potassium and sufficient water to make 1 gallon of solution. The water should not be added until all the chemicals are thoroughly dissolved. Brass may be bronzed by immersion in the following solutions: Brown and every shade to black, 1 pint water, 5 drachms nitrate of iron; or 1 pint water, 5 drachms perchloride of iron; brown and every shade to red, 1 pint water, 16 drachms nitrate of iron, 16 drachms hypo-sulphide of soda; or 1 pint water, 16 drachms hypo-sulphide of soda, 1 drachm nitric acid.

### A DIVERSITY OF QUESTIONS

Lamar, Neb.—Editor Motor Age—Will Motor Age answer the following questions: 1—What is the weight of a 6-horsepower storage battery, also a 10-horsepower? If not used for a time after charging does the energy leak out so that they will not perform as much work as if used immediately after charging? For how long a period would a 6-horsepower battery furnish that power? If it were doing 3-horsepower work would it continue to operate twice as long as if doing 6-horsepower? How long a time is required to charge a battery and is a current of any certain strength required, or does a weaker current merely take more time to charge? 2—What would be the advantages and disadvantages of a hand-made car of the buggy type, for steam or gasoline, with a very short wheel base—say 40 inches—with 38-inch wheels? By wheel base I understand is meant the distance between front and rear axles. Is this correct? I have heard that a shortened wheel base means easier running. Is this true? What would be the characteristics of a motor buggy with 48-inch wheels? Do high wheels tend to easier running and easier riding, as the result of less required power? 3—What should be the weight of a complete 6-horsepower steam power plant for a motor buggy? Which is better for transmitting power from shaft to road wheels, a differential and sprocket chains or chain cable without differential? Would the hydraulic transmission be suitable for a light motor buggy and what is its weight? 4—How much fuel—describe both gasoline and kerosene if you can—is required to raise a pound or gallon of water to 70 pounds steam pressure and how much more to raise it to 140 pounds and again to 1,000 pounds? 5—Which is better for both small and large cars of the buggy type, flash or fire tube boilers, and why? 6—In transmitting power around three sides of a rectangle and again brought on a line with the original shaft, what type of transmission would absorb or waste the least amount of power belts and pulleys, sprockets and chains, spur gear, bevel gear—making right angle turns—or universal joints making less abrupt turns, using say six or eight joints if necessary?—Sanford E. Frazell.

It is impossible to state with any degree of accuracy what the requirements are of storage batteries you ask regarding in section 1. The capacity of storage batteries is not given in horsepower. The capacity of battery needed is determined by your motor. In electric pleasure vehicles some motors are wound to take an 80-volt current and consume 28 amperes current per hour. With 40-cells battery it would take 4 hours at the 28-ampere rate to make a complete discharge. On the other hand, some motors require 35-amperes, and, in order to have a battery of this output, the plates in the battery would have to be larger and the battery weight would be correspondingly increased. Before a definite answer could be given to this, three things must be known, namely: The required voltage for your motor, the amperage consumption per hour, and the distance you expect to get, or, in other words, the length of time required for a complete discharge at the full ampere load. This known, it is possible to determine the size and weight of the battery. Regarding section 2, it would be impossible to use a 40-inch wheelbase with 38-inch wheels, as the front wheels would almost touch the rear ones, and such a vehicle would be very difficult to guide on the road and would be particularly rough in which to ride. Wheelbase is the distance between the front and rear axle. The longer the wheelbase the easier the riding of the car. The larger the diameter of the wheels the easier the riding. Regarding section 3: It would be impossible to give the weight of a 6-horsepower steam plant without knowing whether you intend using a generator or tubular boiler, or the type of engine desired. The chain with differentials has been found satisfactory for transmitting to the rear wheels, as also has the cable without the differential. The satisfaction in either case is largely determined by the construction of the cable and the chains. At present there are no motor buggies of the steam type, and it is impossible to give a satisfactory answer to section 5. The answer to section 6 is highly problematical. It is practice in such cases to use spur gears as employed in the conventional sliding and selective gearset. Belts have been discarded for this work because of their inefficiency due to slipping. Chains have been used but they are noisy and required to be entirely enclosed so as to run in oil. It is much easier to make spur gears than bevel gears for this work, and so they are naturally more used for it. The use of universal joints for such work would call for too much room, they would prove expensive and would not give the efficiency of gears.

### MADE IN EUROPE

St. Louis, Mo.—Editor Motor Age—On page 23 of Motor Age, issue of March 18, I noticed a design of a motor by G. F. H., which had a single camshaft under the crankshaft. This design seems to be a very good one, and I am told is a standard product of the Lanchester and Thornycroft factories in Europe. Can Motor Age verify this statement?—S. McD.

This type of crankshaft was used on certain models brought out by the above named concerns. Motor Age is unable to procure an illustration showing the exact arrangement as used.

# ELECTRICAL DEVICES USED IN MOTOR CARS

By Thomas J. Fay
Part I

WHEN a high-tension device like the jump-spark distributer is incorporated into, say, a magneto, it partakes of an air of mystery, and few indeed are the motorists who will be able to fathom the depths to the extent of arriving at a clear conception of the device. If mystery spreads a veil over a simple thing like a distributer, the same will be true of the more complex devices, but to an accentuated extent. Under the circumstances it will be the aim to differentiate between the functional devices of the respective systems of ignition and discuss their phases individually, so that when they are incorporated the resultant combinations will be free from confusion.

**Makeup of Ignition Systems**

In a general way, every ignition system will be found to consist of several parts: A—The source of electrical supply, which may be an electric battery, magneto, or dynamo-electric machine. The thermopile and the hot tube do not seem to be included in systems used in motor car work, although they are not unknown to the experimental side of the industry, in its pioneer aspect. B—A transformer which may be rotary or static, but which is invariably of the step-up genera and is usually of the static type, in which a low voltage is transformed to a high, for the reason that the low voltage is the more readily generated, and the high voltage is necessary in order to jump the gap in the spark plug. C—In the absence of the transformer, as above referred to, the low voltage is used in conjunction with a wipe-spark device, the function of which is to draw an arc, which does not require a high voltage since the circuit is closed first, and when the fingers, or contacts, as the case may be, separate, the arc is drawn. In process, the low voltage, which would not be capable of breaking down an air gap, is rendered efficient for the purpose, due to the melting of the metal of which the contacts are made, which metal forms a gas. This gas is of lower resistance than an air gap, so that the low voltage is enabled to traverse the widening space for a considerable distance, and the energy of the spark is a maximum.

**Working of an Electric Arc**

This is a detail which should be very well understood, and with a view to rendering the phenomenon the more clear, resort will be had to the working of an electric arc, as it is to be seen in any arc-lamp. Fig. 1 shows the ends of the arc-lamp carbons, at the points, where they come together. At A the carbons are shown separated, as they are when the lamps are first trimmed. When the circuit is closed a magnet in the lamp mechanism draws the upper carbon down or allows it to drop so the two carbons will come together in the manner as shown at

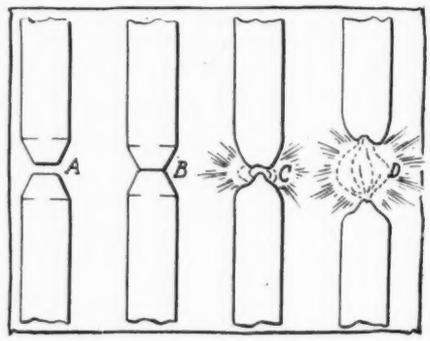



FIG. 1—DRAWING ELECTRIC ARC

B. Directly contact is made, and the circuit is electrically closed, the two carbons are separated, due to the action of the magnet, and the arc is formed in the manner as shown at C. Now, to show that the gas formed out of the materials of which the carbon sticks are made, it is only necessary to draw the arc to a considerable distance, as shown at D, and, if necessary, by means of a spectroscope or other suitable means determine that the atmosphere through which the flame travels is not atmospheric air, but a gas instead, formed out of the carbons, diluted with air, to be sure. The hot gas, so formed, is of far lower resistance than the resistance of air, and the result is that about 1 horsepower of electrical energy is enabled to traverse the gap, or better yet, is dissipated in the gap.

**Same Phenomenon Repeated.**

No matter where the arc is formed, or of what the materials of the electrodes may be, it is the same phenomenon repeated, in which the contact must first be made if the voltage is low, and then, when the electrodes are separated, an arc will draw, even if the voltage is very low, because the resistance of the gap is reduced, under conditions of normal pressure, by the presence of hot gases in which molecules of metal or other conducting media, produced at the instant of breaking the circuit, by the heat of the arc, and augmented as the arc is distended, more or less, depending upon the nature of the materials of which the electrodes are composed. If the electrodes are of carbon, the amount of gas formed will be considerable, and the carbon points will wear away at a rapid rate. If, on the other hand, platinum or iridium is substituted, which materials have a high melting point, and the rate of disintegration of the electrodes will be relatively slow, and the electrodes will last for a correspondingly long time, as a natural sequence.

**Wipe-Spark System**

The wipe-spark system was one of the first to be adopted in motor car work, and its inherent simplicity, coupled with the ability of the system to deliver a spark in which a considerable amount of energy is dissipated, has tended to make and maintain friends. True, a certain amount of adjusting must be done, due to the changing time relation, caused by the wearing away of the contacts, for the reasons as before given, which difficulty is more as a theory than a reality in these days when platino-iridium contacts last so long that it is generally something else about a motor that has to be fixed.

Fig. 2 is a diagram of a wipe-spark system in which A is the switch by means of which the circuit is closed, B represents the battery, or other source of electrical supply, C depicts the iron core of the step-up transformer, D is the primary winding over the core C, E represents the secondary winding of the transformer, F shows the wipe-spark device, and G portrays the combustion chamber in the motor cylinder, in which the energy is unlocked from the fuel. This system does not demand the use of a vibrator coil, and if the wipe-spark device is well made the results are all that can be desired. The advance and retard features are managed by causing a lag or a lead of the timing of the contact of the fingers of the wipe mechanism, by shifting the cam on the camshaft in such a way as to alter the relations.

**Spark and Its Efficiency**

The question of the spark and its efficiency is almost threadbare, but there is one point that will stand repeating; that is, the heat of the spark is that of the electric arc, no matter how it is made, when reference is had to the sensible temperature. The energy dissipated, on the other hand, is quite another matter, and it is on this point that many seem to go astray. It is necessary to distinguish between the sensible temperature and the energy, and it is undoubtedly true that the efficiency of an ignition system is measured directly by the energy in the spark, rather than by trying to claim that the heat of the spark is more or less, depending upon the color of the varnish on the box in which the spark coil is concealed, or some other equally good reason. With the wipe spark, as can readily be seen, it is possible to dissipate considerable energy in the drawn arc, just as energy is dissipated in the arc of a lamp.

**Heat of Electrical Circuit**

For heat of the electrical circuit—and it makes no difference how the circuit is formed—the formula as follows has the virtue of being accurate:

$$h = I^2R \times 0.24 = E\ I \times 0.24 = (E^2 \mid R) \times 0.24$$

When:
h = heat in calories;
I = intensity of the current in amperes;
R = resistance in ohms, or the equivalent;
E = electromotive force in volts.

The only argument that seems to cast doubt on the whole proposition is one in

which it is claimed that a quick burning gas, such as hydrocarbons, in the presence of enough air to provide the requisite oxygen, will do the rest once the gas is contacted with a flame of a sufficiently high temperature to ignite the gas. This argument is probably as weak as pink tea, since the gas has a variety of properties, among which specific heat, which is not of fixed inflammability, at all times or in all the zones within the cylinder walls. In actual practice it is understood that a well designed magneto will deliver far more result than can be realized by the use of some poorly devised battery systems. It can not be due to a hotter spark if, in both cases, the spark plug has the same length of gap, and if all the other governing conditions are the same. If the magneto does better work then, it must be due to the dissipation of more energy in the spark gap, rather than to some other condition, in the absence of more energy.

**Almost Eletrically Simple**

It does not, of necessity, follow that the wipe-spark system is capable of delivering more energy than some other, but it can be made along lines that might well be designated as electrically simple, at some cost of mechanical complication, to be sure. In Fig. 2 the windings are as in a transformer when, as a matter of fact, it would be quite possible to do without the secondary winding and use one coil only, the same to be of a suitable number of turns of wire to afford the requisite voltage for the purpose. With the single winding on the core the coil is what is commonly termed a kick-coil, and the details of design will be dealt with at another time. For the present, reference will be had to Fig. 3, which is a diagrammatic illustration of a jump-spark system, in which A represents a switch, by means of which the primary circuit is closed on the battery B, which circuit, as it leaves the battery, goes to the timer D, thence to the vibrator E. The condenser C is in parallel with the contact electrodes E, one of which is attached to the vibrator spring F, on the end of which is a hammer which is in juxtaposition to the end of the iron core G of the spark-coil. The primary winding H on the core of the coil will be readily traced back to the switch A.

**Secondary Winding Independent**

The secondary winding I of the coil is independent of the primary, as shown in Fig. 3, although in practice it is usual to employ a ground return, which is not such good practice tnat one would care to incur the cost of letters patent, the reasons for which will be discussed with grounded circuits. Theoretically, the secondary winding passes from the spark plug to and around the iron core of the spark coil and back to the other terminal of the spark plug again. In practice, the spark plug J has one wire only and the circuit is completed through the cylinder and other metal parts of the motor, after a fashion as indicated by the dotted lines.

**System's Fundamental Properties**

The functional properties of the system, as shown in Fig. 3, may be enumerated as follows:

The switch is for use in opening and closing the primary circuit.

The battery B, a magneto might be made to serve instead, is used as the source of electrical energy.

The condenser, the function of which is to absorb energy at one interval, and to return the energy to the circuit under favorable circumstances, prevents disruptive sparking at the electrodes E.

The function of a timer is to time the closing of the primary circuit.

The function of a vibrator interrupter gap is to interrupt the primary circuit when the hammer F is pulled towards the core G.

The hammer head on the extremity of the vibrator spring, of magnetic material, iron, responds to the pull—attraction—of the magnetic core when it is excited by the magneto-motive force in the primary coil.

The function of the core of the transformer is to render the path of the magnetic flux of the lowest possible magnetic reluctance.

In relation to the low-tension source of electrical supply and, in fact, the means of the magneto-motive force—it being the case that the number of turns multiplied by the current in amperes flowing in the primary circuit—the primary winding of the spark coil equals the magneto-motive force in ampere turns. In modern nomenclature, the magneto-motive force is denoted in terms of gilberts, abbreviated, M. M. F., and the value of the gilbert is that due to:

$$\text{M. M. F.} = \frac{10}{4''} = 0.7958 \times \text{ampere turns.}$$

**Furnishing High Potential**

The secondary windings, I, furnish the high potential by induction, on a basis in which, for illustration, if there are ten times as many turns of wire on the secondary as there are on the primary coil the secondary voltage will be multiplied by ten, from which must be deducted such losses as will dim the results.

From the secondary coil, on the core of the coils, to the spark plug J, is a direct lead. The function of J is obvious and is limited to such electrodes as will provide a break in the secondary circuit at the point in the cylinder where the spark is wanted, it being a property of electricity to propagate a spark by a display of heat and light at any point in the circuit which is of sufficiently high resistance to afford the right conditions.

(To Be Continued Next Issue.)

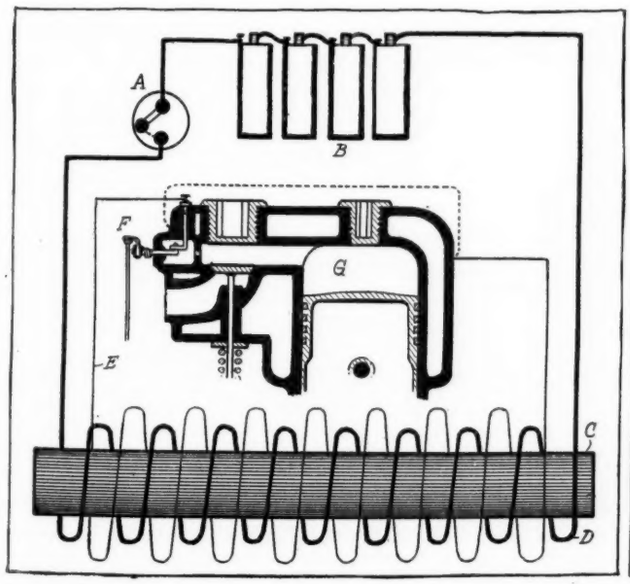



FIG. 2—SIMPLE WIPE-SPARK IGNITION SYSTEM

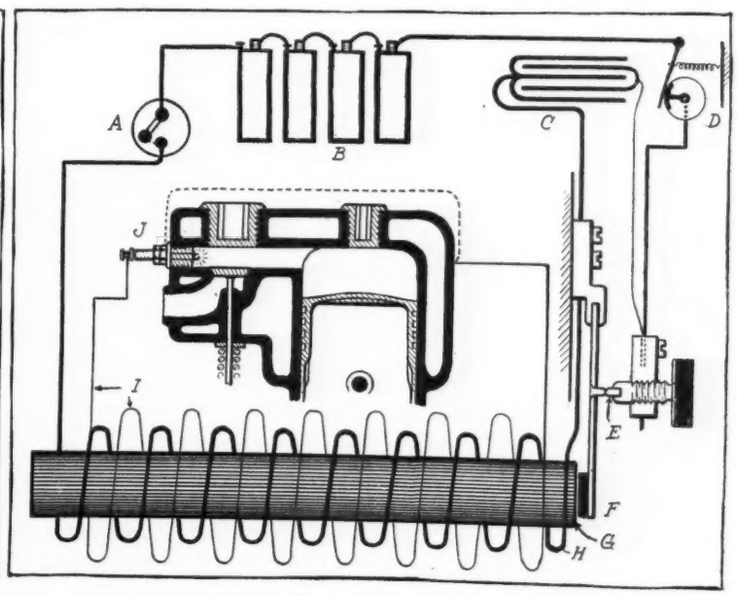
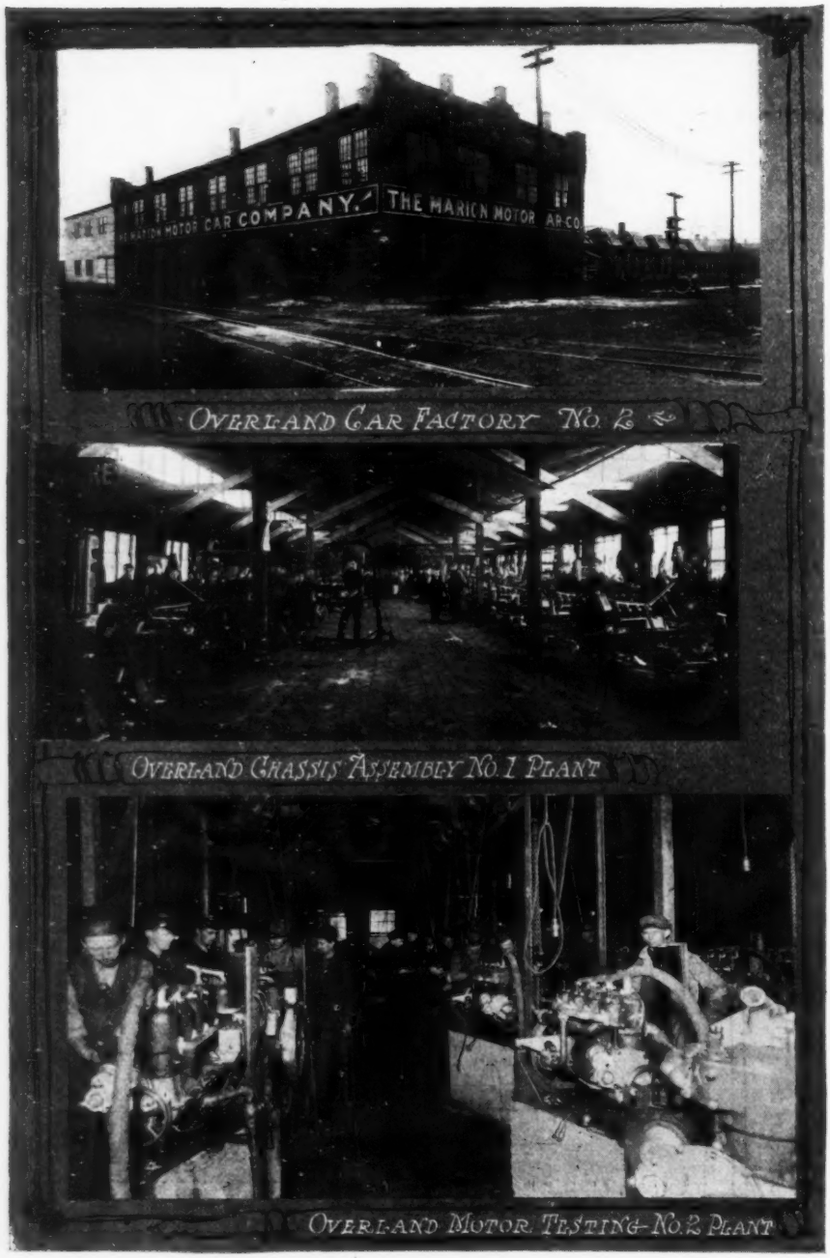



FIG. 3—SIMPLE JUMP-SPARK IGNITION SYSTEM

# INDIANAPOLIS' FOUR OVERLAND FACTORIES

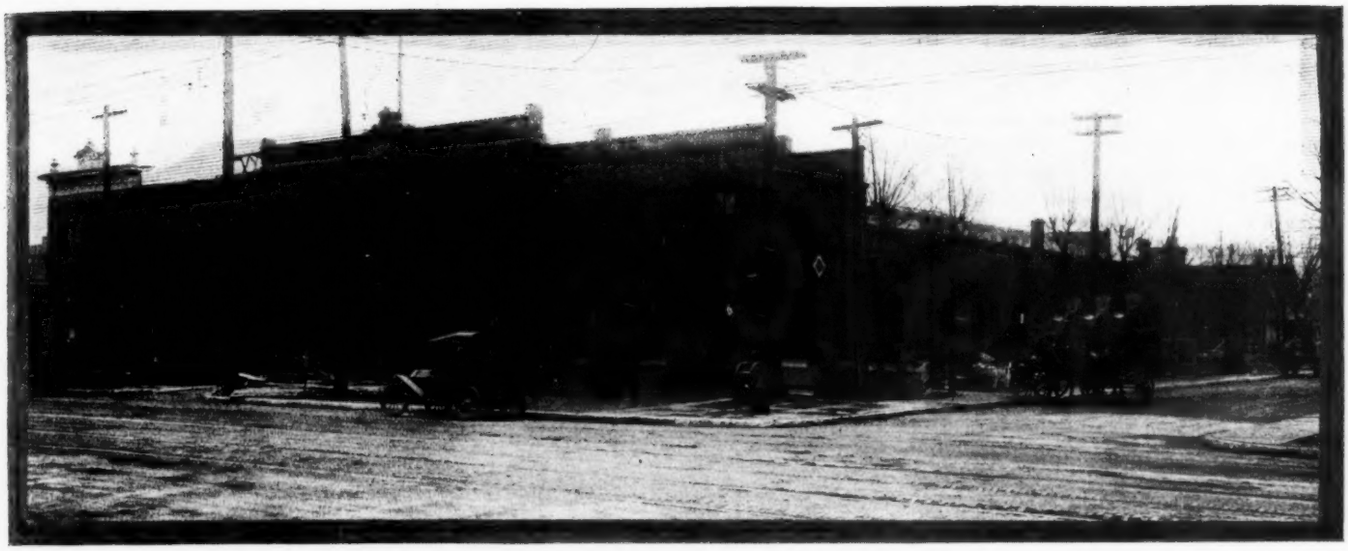
OVERLAND PLANT NO. 1, WHERE PLANETARY-GEAR OVERLAND CARS ARE ASSEMBLED


THE MARION MOTOR CAR COMPANY.
THE MARION MOTOR CAR CO.
OVERLAND CAR FACTORY NO. 2
OVERLAND CHASSIS ASSEMBLY NO. 1 PLANT
OVERLAND MOTOR TESTING—NO. 2 PLANT

ALTHOUGH organized in August, 1907, the Overland Automobile Co. has since then developed into one of the big factories in the production of medium-priced cars, and for this year will manufacture approximately 3,500 cars of its different models. It is one of the examples of a big industry without a good factory, and in order to get its 1909 output manufactured in reasonable time, the company has no fewer than four factories well distributed over the four quarters of Indianapolis. The first plant, for convenience styled No. 1, is a low, one-story, frame building, located on Oliver avenue close to the river, and is used for housing the executive officers of the company and assembling Overland models 30 and 31, which are the 1909 types, with planetary gearsets. In this plant 250 men are engaged in the assembly work, there being very little machining done, this process being limited practically to the aluminum housing for inclosing the gearset.

### Second of Four Plants

Plant No. 2 is a more up-to-date, brick structure, located on Fifteenth street and is the old Marion plant, where Marion cars were built last year. This factory, acquired by the Overland people during the early fall of 1908, is used for the manufacture of Overland model 32, which is a four-cylinder car, with selective gearset, and in this factory is also manufactured the Willy's six, which is one of the new members of the Overland output for this season. In this factory all of the Overland engines are constructed; that is, including the two models with planetary gearsets, built in the No. 1 plant. Five hundred men are engaged at the present time, which is a number vastly in excess of the reasonable accommodation of the factory, but is an example of the congested condition that is found in several motor car factories at the present time. Plant No. 4, used for the final assembly of some of the selective gear cars, is located in the Industrial building, the company having rented space on one of the floors for this work. Plant No. 3 is the old building, used by the Speed Changing Pulley Co., and located on East Washington street. In this building, all of the bodies for the entire Overland output,



OVERLAND PLANT NO. 3—SPEED CHANGING PULLEY BUILDING—WHERE BODIES ARE MADE

as well as all bodies for Marion cars, are manufactured and finished complete.

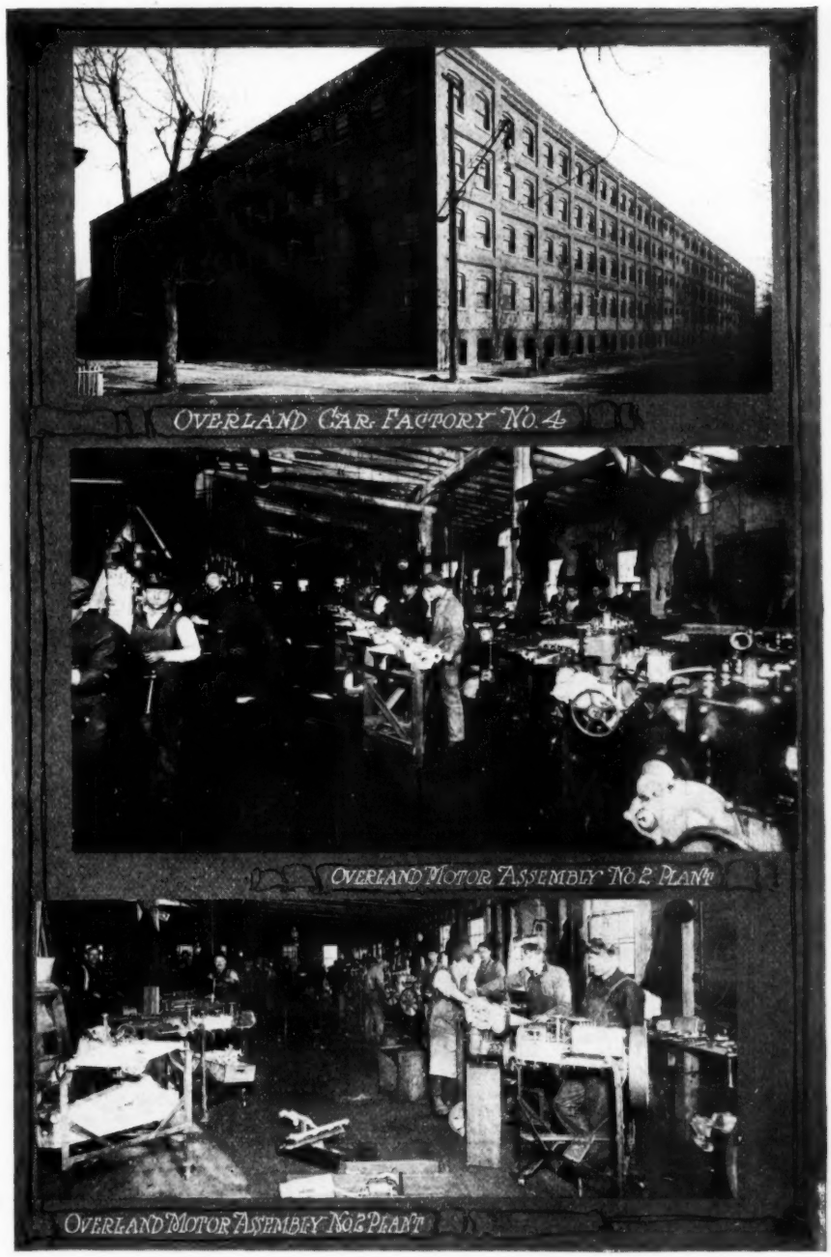
Like all of the other plants, it is a veritable bee-hive, space being at a premium, in fact so great a premium that one of the upholstering departments is located among the rafters in the top of the building. The inconvenience of manufacturing motor cars in four plants, is self-evident—but the company hopes to be housed in one sufficiently commodious building for the manufacture of its 1910 cars. The loss in time by the different officers having to make daily trips among the four buildings, is but one of the considerable factors and to which could be added the transporting of motors from the No. 2 to the No. 1 plant, as well as bodies from the No. 3 plant.

**The Original Overland Plant**

Plant No. 1, in which the two models with planetary gearset are manufactured, is the original Overland property, and although a one-story building, is of sufficient capacity to allow of thirteen cars per day being shipped. This plant, as already stated, is simply an assembly one and on the floor during a recent visit, Motor Age correspondent noted twenty-six chassis in the course of assembly on the main room. In the painting department of this building thirteen other chassis were complete, and in a third room were fourteen more approaching the complete stages of assembly. On every hand aisles were piled with material, 109 frames being counted in one stack, and thirty-eight in another pile, with several of the brackets attached and awaiting the force of assemblers, who were soon to begin bringing all the component parts of the car together. The two models—30 and 31—assembled in this building are but a continuation of the 1908 Overland, and are the only ones for this year to use the two-speed pedal-controlled planetary gearset on the rear axle.

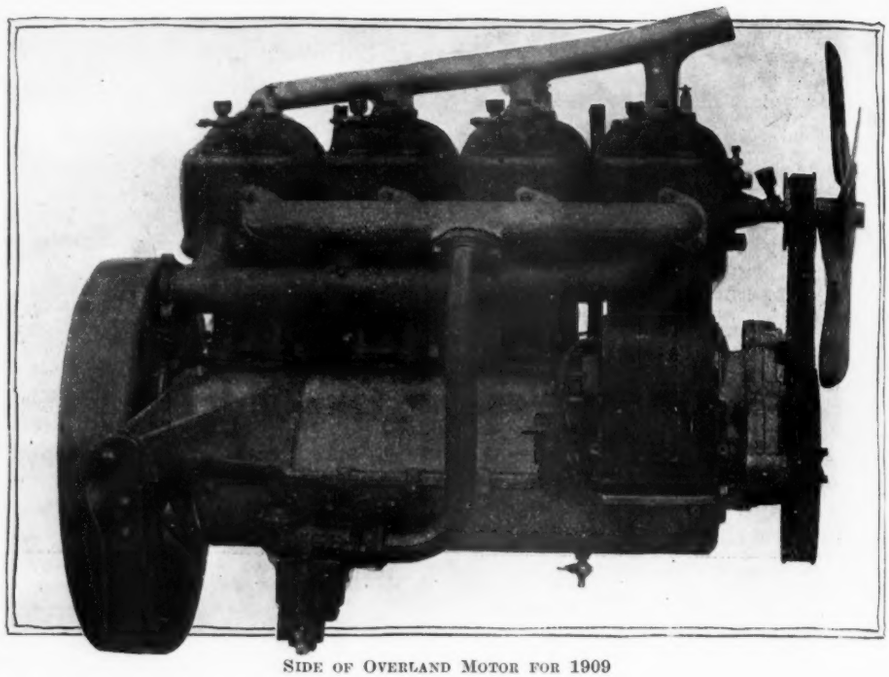
**Improvements in Models**

These cars have been considerably improved, however, the most conspicuous improvement being an increase in the size of the motor—its present measurements being 4 by 4½ inches bore and stroke, which gives a rating of 25.6 horsepower. The stroke has been increased ½ inch over 1908, but the car has been still fur-



ther perfected in not a few respects. The oiler, which was driven by belt, is now operated by an eccentric from the camshaft, a spring tension on the fan belt is used, a magneto furnishes the ignition current, the wheelbase has been raised from 96 to 105 inches, tires from 3 to 3½ inches and other alterations made.

It is in Plant No. 2, however, where the real energies of the Overland company are observed, and where all of the motors are manufactured. The Overland motor has several characteristics, one of the first being the employment of thermo-syphon water circulation and which is illustrated herewith. The base of the radiator is located 6 inches lower than the exit of the pipe W1, which feeds water to the bottom of the jackets on the right side, and the entrance of the return pipe W to the top of the radiator is 9 inches above the tops of the jackets. The water entrance and exit passages to the jackets are 1⅛ inch in diameter, and particularly large water spaces are used, there being 1½-inch space above the cylinder head and ½-inch of space around the cylinder walls, with as much as possible in the valve chambers. The water piping is of medium diameter only, being considerably smaller than that employed on Renault cars, which must be looked upon as pioneers in thermo-syphon cooling. The radiator used is a Kinsey vertical-tube one of approximately 25 per cent greater capacity than would be used if a water pump were installed. In rear of the radiator is a belt-driven fan, improved over that of last year, in that a spring tension is employed, which keeps the driving belt tight at all times. As with all other exponents of thermo-syphon cooling, the Overland company bases its merits on the fact that the rapidity of circulation is in proportion to the heat of the cylinders, and that whether the car is traveling slow or fast the water circulation is in direct proportion of the needs and not in any fixed ratio to the speed of the crankshaft of the motor. In all of the Overland motors, whether fitted to planetary, selective or six-cylinder cars, the same type of L-head motor cylinder is used and the same system of cooling fitted.



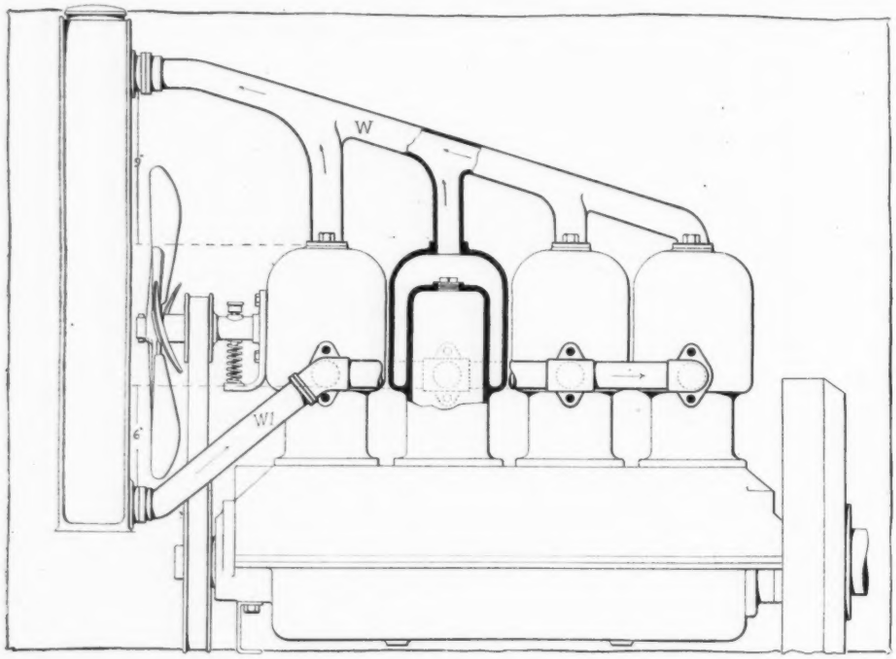
SIDE OF OVERLAND MOTOR FOR 1909

**Features of Overland Motor**

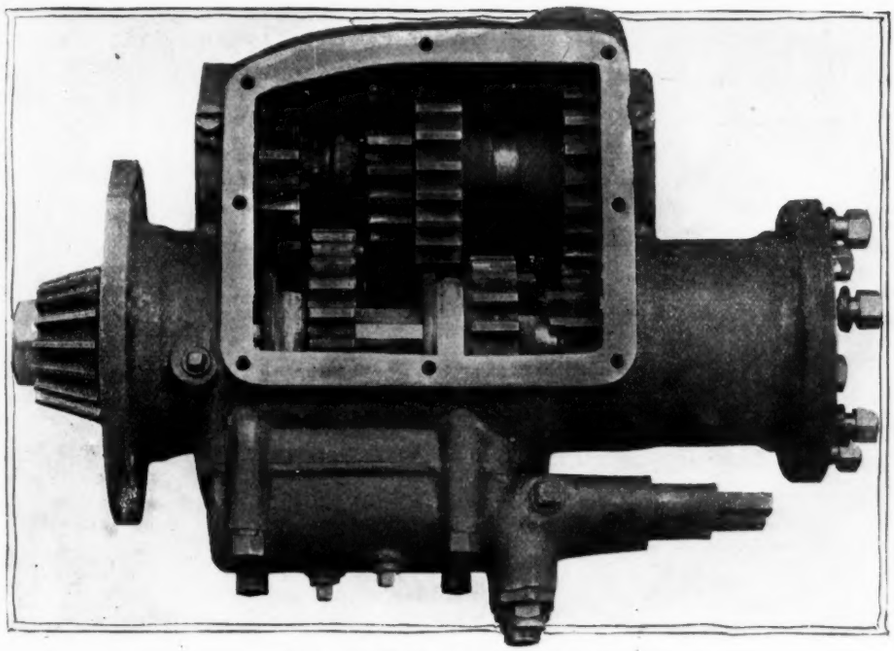
The Overland motor, in addition to its thermo-syphon circulation, carries a few characteristics rarely found in power plants of its size, one of which is the employment of separately-cast cylinders. Another is the use of a five-bearing crankshaft and still another is the equipping of all four-cylinder cars with the Remy magneto and six-cylinder cars with a Splitdorf. In the manufacture of the motor the offset crankshaft receives no little attention, and placing it $\frac{5}{16}$ inch from center line of cylinder is looked upon to add not a little to its power. All of the main bearings are hand scraped, the cylinders and other parts receive the conventional grinding process and micrometer measurements are used.

**Busy Testing Plant**

In the motor testing department thirty engines, or motors, were being given their usual tryout, consisting of a 4-hour run under belt, followed by a test, extending from 8 to 10 hours when they are run on their own power. As in other departments, so in this; the overcrowding is everywhere apparent. In spite of the fact that one man looks after three or four engines, the place is badly congested, which, however, does not interfere with the test given each one. The variety of work is the same as in the majority of motor testing departments. After the motor is run in by belt and started on its own power, adjustments of the carbureter are of primary importance. This done, an examination is made to see if the flywheel runs true and that there is no wobble; next comes a test to discover knocks in the motor, in which the tester holds an iron bar in his hand, one end of which is in contact with part of the engine in which he is trying to locate a knock and the other is in touch with the forehead or in some cases with the car. By this method the slightest pound in the bearings of the crankshaft, of the connecting rods or wrist pin can be determined. With the assurance that there is no knock in the motor, the tester turns his attention to verifying the time of the valves, and seeing that they agree with the markings for the timing on the flywheel. These, and many others, are the tasks of the testers, so that when the motor leaves this department it is ready for the chassis




THERMO-SYPHON SYSTEM USED IN OVERLAND MOTORS



SELECTIVE GEARSET ON OVERLAND 32

and thence goes into the hands of the road tester.

On the motor an external mechanical oiler is used, with five oil leads conducting to the cylinders and one to the rear bearing of the crankshaft. These come in for their share of inspection in the test room; care is taken to see that the water pipes do not leak where they attach to the castings, and similar care is taken in conjunction with the intake and exhaust manifolds. The motors are built for running compression of 80 pounds, and in addition to the improvements already noted, might be added the elimination of the timer because of the fitting of a magneto with a continued distributer and the employment of semi-herringbone gears for guiding the camshaft. The camshaft is made with intake and exhaust shafts integral and is carried on three bearings.

Although the 1908 Overland used the planetary gearset exclusively in which the changes in speed were all controlled by pedal, the new cars, namely, models 32 and 34, use the selective set. In the four-cylinder model 32 it is being carried in conjunction with the rear axle, whereas in the Willy's six it forms a unit with the rear axle but is located amidship. In the Willy's six a multiple-disk clutch is contained in a forward compartment of the gearbox, and the box itself supported from a cross piece of the frame. The gearbox is formed as a unit with the rear axle by a tube enclosing the drive shaft and attaching at its forward end to the gearbox and at the rear to the differential housing. The drive is not through this tube, however, but through the three-quarter elliptic springs. It is the present intention of the company to build 350 of these Willy's six cars during the present year, and present deliveries are taking place at the rate of three a day.

The six-cylinder motor is but a 50 per cent increase on the fours and its length is 11⅞ inches greater. The I-beam front axle is placed in line with the front of the radiator and on the rear axle internal structural difference in this model, in comparison with the other Overland products, and external brakes are fitted. One is that it drives through the three-quarter elliptical spring, whereas on the other models the drive is through radius rods, extending from the rear axle ends to the frames.

## Manufacturers' Communications

Indianapolis, Ind.—Editor Motor Age—That 1909 is to be a banner year for the motor industry not only from a manufacturing standpoint, but from one of pleasure, sport and pastime, is evidenced by the recent shows, with their accompanying unprecedented sales and real enthusiasm which has been demonstrated with more vigor on the part of the manufacturer, dealer and buyer than at any time since the infancy of the motor car in America.

It would appear that 1909 will see a record-breaking number of tours of all classes, but instead of having all tours of a competitive nature, with set schedules and long daily journeys, why not have national tours similar to that held last summer through the fascinating New England territory by the Automobile Club of America?

Such enjoyable tours as these would create a great deal of interest. There is no question but what there are many motor car owners who believe in and would enter such tours, who do not care to enter a more strenuous contest such as the Glidden. A tour running without schedule; in other words a go-as-you-please event, would arouse interest, especially with women and children.

While such a tour would not necessarily demonstrate the good and bad points of a car for the benefit of the manufacturer, such as is the case in the Glidden, it would demonstrate to the buying public and prospective buyers that the present-day car can travel under regular touring conditions over all manner of roads.

If such events are held it would mean that the entrant could stop whenever and wherever he liked, could eat his lunch in the shade of stalwart trees or in a hotel. It would mean that women and children would not become tired out with the day's journey and that the country and scenery could be better enjoyed than if the car was traveling under schedule and had to arrive at controls at a given time. The elimination of penalizations would leave the mind of the drivers and passengers free to enjoy every bit of the journey.

Many members of the American Motor Car Manufacturers' Association are in sympathy with such tours and believe that it would instill into the entrants a firmer belief in the motor car and the joys of touring would be better exemplified.—W. C. Marmon.

### SPECIFICATIONS OF OVERLAND MODELS

**PLANETARY GEARSET MODELS**

Horsepower—25.6
Cylinder bore—4 inches
Piston stroke—4½ inches
Wheelbase—105 inches
Tires—32 by 3½ inches
Cooling—Thermo-syphon
Ignition—Magneto and battery
Transmission—Two speed planetary located on rear axle
Front springs—Semi-elliptic
Rear springs—Elliptic
Motor support—Three point
Lubrication—Mechanical oiler
Model 30—Three-passenger roadster
Model 31—Five-passenger tourist
Brakes—Internal rear hubs

**MODEL 32**

Horsepower—25.6
Cylinder bore—4 inches
Piston stroke—4½ inches
Wheelbase—110 inches
Tires—34 by 3½ inches
Transmission—Three-speed selective on rear axle
Cooling—Thermo-syphon
Front springs—Semi-elliptic
Rear springs—Elliptic
Motor support—Three-point
Lubrication—Mechanical oiler
Brakes—Internal and external on rear hubs
Capacity—Four or five-passenger

**WILLYS SIX**

Horsepower—38.4
Cylinder bore—4 inches
Piston stroke—4½ inches.
Wheelbase—121 inches
Tires—36 by 3½ inches
Cooling—Thermo-syphon
Ignition—Double magneto and battery
Transmission — Three-speed selective amidship
Front springs—Semi-elliptic
Rear springs—Three-quarter elliptic
Motor support—Three-point
Lubrication—Mechanical
Brakes—Internal and external rear wheels
Capacity—Three, four or five-passenger
Ignition—Magneto and battery

# Legal Lights and Side Lights

## LINCOLN WAY BILL PROGRESS

WHEN the Lincoln highway bill came up in the house at Harrisburg last Wednesday the opposition, after several fruitless attempts to amend it, was enabled to prevent its final passage by getting in a clause providing for the employment of none but American workmen in its construction. This had the effect of delaying the bill until Wednesday of this week, to allow time for reprinting it before it comes up for final passage. The democrats were back of the filibuster, and managed to get sufficient help from among the country republicans to effect a temporary hold-up. Its advocates are confident, however, that it will finally become a law. There is no denying the fact that the opposition is dangerous; their contention that the 60-foot width provided for is needless over the greater portion of the route is admittedly based on reason. Many of the Pennsylvania Motor Federation clubs believe that 40 feet is ample. J. H. Weeks, chairman of the good roads committee of that organization, is outspoken in his opposition to this feature, which he thinks would eat up three-fifths of the $50,000 appropriation provided for in the Sproul good roads bill, owing to the immense damages that would have to be paid. The house passed the bill Wednesday and it now goes to the senate.

The Townsend motor bill, which includes the most important features of the Grim bill, which has been dropped, has been finally whipped into shape, and as it meets the views of a majority of the senators, will probably meet with little opposition in the upper chamber if it gets through the house this week. The Pennsylvania Motor Federation has crystallized all its efforts on the Townsend measure, and, realizing that the time is short, urges the making of concessions to get the measure through.

## CITY TAGS CONTEMPLATED

Examination of and licensing of drivers of motor cars in Illinois is contemplated by Senator Dellenback, who has introduced into the legislature senate bill No. 271, which provides for the amendment of section 1 or article 5 of the cities and villages act by the insertion in that section of clause 97, which reads as follows:

To provide for the examination and licensing of all persons driving or operating motor vehicles propelled by electricity, steam, gasoline or power other than muscular power.

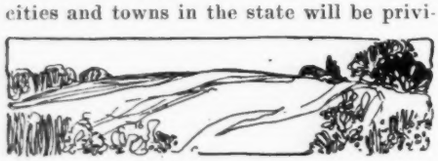
If this amendment passes it will also amend the motor vehicle act so that all cities and towns in the state will be privileged to examine drivers and also to license them. Chicago evidently anticipates favorable action on the Dellenback bill, for its city council already has passed an amendment to section 161 of the revised municipal code which in addition to the examination feature also provides for each car carrying a city tag. As the present state law now reads this extra tag cannot be carried without violating the state motor vehicle law. The amendment to the city ordinance reads as follows:

Any person desiring to operate or use a motor car, motor cab or other similar vehicle in the city shall apply to the said board to assign him a number in conformity with the provisions of this chapter. The name and address of such applicant shall be registered in a record book kept in the office of said board for such purpose, and a number shall be assigned to such person and furnished him as hereinbefore provided, and the number registered in such record book opposite the name of such persons.

Such number shall be shown by such person on his motor car, motor cab or other similar vehicle, as required herein, until December 31 next after the date of such application, when such person shall again apply to such office for a number to be shown on such person's motor car, motor cab or other similar vehicle, as herein provided, for the succeeding year and until December 31 thereafter; the number provided herein to be used only during the license year for which it was issued, it being intended that each vehicle provided for in this chapter shall be identified by one number good until December 31 following, and that a new number shall be taken out for each license year that any such vehicle is operated.

## DRAG LAW FOR IOWA MOTORISTS

Iowa motorists are highly elated over the passage of a law in the Iowa legislature, known as the drag bill, which became operative last week. There has been a drag law in effect for several years, but there were several objectionable features in it which are eliminated by the new bill. The principal provisions of the new law are: Trustees shall pay not to exceed 50 cents per mile for each mile actually traveled in dragging. It requires the city councils of cities and incorporated towns to cause the main traveled roads within the corporate limits leading into the city or town to be dragged systematically and regularly. It shall be unlawful for any person or persons to drive, ride, or cause to be driven, a vehicle of any description on or upon the south half of an east and west highway or the east half of a north and south highway after the same has been dragged and before such portion of the highway shall have dried sufficiently to pack under a horse's feet, or frozen enough to carry, provided that nothing in this section shall apply to those instances where it is impossible to drive with safety on the west or north side of the road. Penalties for violating any provision of the act are provided—the first offense, $1 to $10; after offenses, $5 to $25. The bill also requires township trustees to contract for dragging at the April meeting.



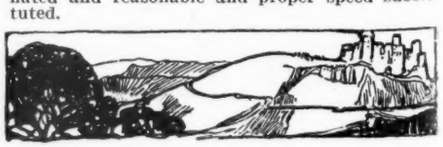
## WANT TO TEST TAXIMETERS

The committee on mercantile affairs of the Massachusetts legislature has reported favorably upon a bill introduced by Representative Malley that seeks to look after the meters on taxicabs. The bill proposes to place the meters under the jurisdiction of the state department of weights and measures. Commissioner Parker, who has charge of the sealers' department, is much interested in the bill, and he states that if it is passed the first thing he will order is that all the meters shall be attached to the front axle of the taxicabs. Measured courses will be provided in Boston where it will be possible to try the meters out from time to time. But this will be but a small detail of the work. It has been demonstrated, so it is claimed, that slippery streets have much to do with running up the bills on a passenger. Another way of increasing the fares is to deflate the tires an inch and this sometimes means that a tire that is fully inflated, that will make 562 revolutions a mile, will run up to 800 with a 1-inch deflation. A testing room will be established, fashioned after the one in London, and all the devices for testing meters under conditions met with in the streets, such as jarring, slipping, etc., will be installed. Then the meters will be tested from time to time. The bill will give the deputies authority to stop a cab and have it go over the measured course whenever directed, and also the meter may be ordered sent in for a test. All meters will be tested out, too, before they are allowed to be installed. Good results would follow such testing.

## TAX BY TIRE DIAMETERS

A registration tax based upon tire diameter is suggested by the New York State Automobile Association, which, at its last meeting, passed the following resolution, after it had placed itself on record as favoring not only the issuing of licenses to drivers of all motor vehicles, but the enaction of penalties by the suspension of licenses when clear proof is shown that the drivers have been regardless of public safety in the operation of their cars:

Resolved, That the New York State Automobile Association places itself upon record as being in favor of the issuing of licenses to the drivers of all motor vehicles, with the instituting of penalties for suspension or revocation of such licenses; and, furthermore, agrees to an annual registration fee, not to exceed $10, for motor vehicles, based upon the diameter of the largest tires used on the vehicle, providing such money be expended in the maintenance of improved highways and such motor vehicles are now taxed as personal property and the present miles per hour restriction eliminated and reasonable and proper speed substituted.



# News from the Motor Clubs.

New Club House Just Erected at Norristown, Pa., by Norristown Automobile Club

**Maryland Motorist Out**—The first issue of the Maryland Motorist, the official journal of the Automobile Club of Maryland, was issued this week. The paper contains information of special interest to the owners, particularly in regard to the Swann motor vehicle bill.

**Sign-Raising Day**—The Columbus Automobile Club, of Columbus, O., is to have a sign-raising day. The Columbus club has ordered 100 galvanized signs which will be placed at important points on the favorite touring roads adjacent to the city within the next month.

**Will Pick Out Routes**—Members of the Automobile Club of Buffalo will attend a public hearing to be held in that city on April 15 by the New York state highway commission to pick routes for proposed good roads. The commission proposes this year to build about 3,200 miles of road along thirty-seven new routes. The cost will be borne by New York state and the hearing is simply for the purpose of getting suggestions as to the most desirable routes. The routes near Buffalo to be considered at the hearing are from Buffalo to Batavia; Olean to Buffalo; Irving to Buffalo, and Tonawanda and Buffalo to Attica.

**Roused to Activity**—Following a period of several months' inactivity after the organization of the Council Bluffs Automobile Club with sixty members, an enthusiastic meeting was held and matters of importance to the club discussed. Interest was aroused by a letter from F. H. Elliott, secretary of the American Automobile Association, urging the Council Bluffs club to send a delegate to the Iowa state conference to be held in Marshalltown April 20, at which time it is proposed to perfect a state organization. Dr. T. B. Lacey was elected as a delegate with instructions to promote the movement as much as possible. Other Iowa cities having taken similar action are Des Moines, Mason City, Sioux City and Davenport.

**Joining the A. A. A.**—The Utah Automobile Club, of Salt Lake, has voted to affiliate with the American Automobile Association. Aside from the natural advantages of affiliating with the national body, the directors of the club realized the importance of such an action in view of the series of races and hill-climbs planned for this summer.

**Norristown Progressive Club**—Few even of the larger cities in the country can lay claim to a more enthusiastic brand of motor enthusiasm than Norristown, the little metropolis of Montgomery county, Pa. Ordinarily the propinquity of a million-and-a-half city ought to have a tendency to overshadow the efforts of the provincials. But not so in this instance. Organized 2 years ago, the Norristown Automobile Club now boasts of over 300 members, and has a waiting list considerably larger than the entire memberships of some of the smaller clubs in the Pennsylvania Motor Federation. Early last fall ground was broken on the Klein farm, 1½ miles west of Norristown, on the main road to Reading, and some days ago there was a grand house-warming, to which all the motorists for miles around were invited. The house, built of brick, is on the bungalow order—one story and a basement—40 by 40 feet in dimensions, with a 12-foot porch entirely surrounding it. The tract on which it is built is 110 by 250 feet, and on the rear portion of the lot a shelter shed capable of accommodating a score of cars has been erected. The entrance from the porch on the main floor leads into a large Bohemian hall, 40 by 20 feet, richly finished and furnished in mission style, with a huge open fireplace at one end. On the same floor are cloakroom, women's parlors, governors' room, steward's quarters and lavatory. The basement is mainly taken up with a huge, quaintly-furnished rathskeller.

**Meldrum Succeeds Quayle**—New officers have been elected by the New York State Automobile Association as follows: President, Herbert A. Meldrum, of Buffalo; first vice-president, Frank G. Webb, of Brooklyn; second vice-president, M. L. Ryder, of Albany; third vice-president, S. C. Tallman, of Auburn; treasurer, Hurlbut W. Smith, of Syracuse; secretary, Bert Van Tuyle, of Rochester. The retiring president, O. A. Quayle, who has served 3 years, declined to accept a re-nomination. During his presidency the number of clubs in the New York state association has more than doubled, there now being forty-five such organizations affiliated with the main body; while the individual membership has increased from 2,500 to 4,500.

**Rhode Island's New Rules**—The Rhode Island Automobile Club at a special meeting called recently adopted a new set of by-laws and a constitution. The principal changes effected relate to membership and dues. The annual dues, heretofore $25 for active members, has been dropped to $15, and the dues for associate members are dropped from $15 to $10. Under the old rule anyone living outside the state could be made an associate member. The new rules require that an associate member must not only live outside the state, but also outside a radius of 40 miles from Providence. The state is so small that many Massachusetts motorists as associate members enjoyed the same privilege as the men who were regular members, but for a smaller fee. The limit for active membership is to be increased from 250 to 350.

# From the Four Winds

N S E W

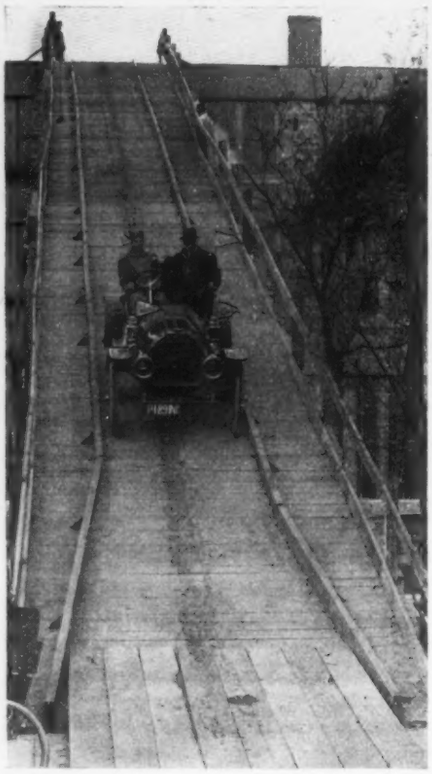
**Climb at Logansport**—The Oakland 40 won the silver trophy cup in the Morgan hill-climbing contest held at Logansport, Ind., last Thursday.

**Gives Up Clubhouse Idea**—The new quarters committee of the Automobile Club of Hartford appointed at the last meeting to look over desirable locations for the club home has received several good offers. The clubhouse idea has been abandoned, temporarily, at least. The club is and has been housed in the Allyn house for the past year. It is pointed out by one faction that it is best to remain in the present quarters.

**Run to French Lick**—Plans are being made by the Indianapolis Automobile Trade Association for an endurance race to French Lick next month. It will be held about May 20 and will last 2 and possibly 3 days. A similar run was made last October, about thirty cars participating. An innovation will be introduced this year by holding a hill-climbing contest while the cars are at French Lick. As was done last year, there will be different routes going and coming with checking stations at various points. The association will have its plans completed within a few days.

**Track Meet June 17**—The Bay State A. A., of Boston, has picked out June 17 as the date for its race meet at the Readville track. Already a sanction has been asked for. The Bay State A. A. has held a number of track meets which always have been well managed. The track recently passed into new hands and the owner has set to work to improve it. A new grand stand will be built and the surface of the track improved so that when the meet takes place it should be a success. June 17 is a local holiday in Boston and there are no other sports to detract from the motor racing.

**Des Moines Wants a Show**—Jealous of the spreading fame of several sister cities, principally Kansas City, Omaha and Denver, as show towns, Des Moines owners are already talking over plans for an elaborate show next year. As a beginning, the Iowa Automobile Club, which a few days ago filed articles of incorporation, will hold its annual meeting within a few days, when it is expected fully 500 motorists of Des Moines, together with those from other cities and towns in Iowa, will be in attendance. An effort will be made to co-operate with members of the legislature and come to some kind of an agreement regarding speed regulations. The present Iowa laws provide that the driver of a team of horses shall turn to one side when a motor car comes up behind him, and this is one clause that they will undertake to have enforced. The officers of the Iowa Automobile Club are: John Gibson, president; W. W. Sears, vice-president; C. R. Prouty, secretary; W. E. Hamilton, treasurer, and Lawrence Aulman.



FISHER HILL-CLIMB AT INDIANAPOLIS

**Russia in Market**—An American consul in Russia reports that the local government officials have submitted a favorable statement on the proposition of installing a system of motor buses between certain points in that region, and will shortly purchase four 30-35-horsepower machines, with a capacity of twenty-four passengers, for use in this connection.

**Fixing a Famous Road**—The famous Whitefish Bay drive, from the city limits of Milwaukee to the northward, will be put into prime condition before the heavy summer traffic begins. The Milwaukee Automobile Club's membership cards give members the privilege of using the road at a small fee. The drive will be resurfaced with tarvia and will be dustless.

**Made Its Own Hill**—The absence of any hills worthy the name in the vicinity of Indianapolis makes it impossible for the local dealers to demonstrate to prospective purchasers the hill-climbing capabilities of the various cars which they handle. The Fisher Automobile Co., however, got around this difficulty in a very ingenious way. A temporary structure was erected from the side street to the roof of the garage. The length of the climb was 134 feet, with a grade of 39½ per cent. The Overland car made this climb in 9 seconds. This stunt was performed three times each day during show week.

**New Self-Starter**—A new motor car starter has just been invented by George Burress, of Indianapolis. It can be attached to any motor car, gasoline engine or launch, and in the case of the former the car can be started without leaving the seat. It operates by a pedal controlling a series of compound levers.

**Syracuse Wants a Run**—The Syracuse Automobile Dealers' Association is contemplating an endurance run in the near future. The course has not yet been determined, but the large number of new agencies which have opened up here this spring has made the competition keen and a spirited contest is looked for.

**Bowlers As Motorists**—Eight hundred miles by motor car to attend a bowling tournament is an expedition planned by a party of Tiffin, O., bowlers who expect to attend the big bowling tournament at New York city from May 24 to June 12. There will be two or three five-men teams to enter the tournament from Tiffin, and as each man will be accompanied by his wife, the party will consist of about forty persons.

**Shows in Indiana**—Two Indiana cities had motor car shows during the week of March 29. They were Newcastle and Logansport, the former being the home of the Maxwell-Briscoe Motor Co. At Newcastle the show was held during the annual horse show April 1, a parade during the afternoon being one of the special features. At Logansport all of the dealers exhibited in their own salesrooms and motor cycle races were run.

**Talk On Legislation**—The judiciary committee of the Rhode Island legislature gave a hearing on a number of amendments proposed by the Rhode Island Motor League, which seeks to lighten the burden now resting upon the motorists because of the present laws. George H. Huddy presented some good arguments in favor of the legislation. There was practically no opposition and it seems certain that some of the provisions, at least, will be adopted.

**Moving a Car Through a Low Door**—A photograph shows the expediency adopted by the Nordyke & Marmon Co. to get a large Marmon landaulet through a low door into its salesroom in Indianapolis, Ind. The 36-inch wheels were removed and 18-inch wooden wheels with cotton belt tires were substituted, the car then being driven by its own power over pavements two squares and into the building to its place.

The large expanding brake shoes, 17 inches in diameter, had only ½ inch clearance.

**Double Tax Liable**—The circuit court at Columbus recently held that there is nothing in the state law that prevents a city from requiring motor car owners to pay city license fees in addition to the state tax.

**Electric Shows Speed**—One of the first instances on record of a driver of an electric being arrested for speeding occurred in Milwaukee last week. H. F. Curtis, a salesman for the Kopmeier Motor Car Co., while demonstrating a Detroit, made by the Anderson Carriage Co., took 3 blocks on a side street at 22 miles an hour. Curtis did not know his speed, but the motor cycle cop just behind him did. He paid a fine of $28.75 the next day.

**Egg Demonstration**—In order to demonstrate the easy riding of his Oakland car to a party of friends, J. W. Woolford, of Baltimore, placed 12 dozen eggs in a basket without packing and drove from his place of business to his home. The route was over cobblestones and ruts as well as good streets, but when Mr. Woolford arrived at his destination not one of the eggs had been broken. The basket was in the rear part of the tonneau.

**Want to Be On Route**—The Milwaukee Automobile Club has chosen a committee consisting of M. C. Moore, director; W. L. Hibbard, vice-president, and James T. Drought, secretary, to "go out and get the Glidden tour." The club does not hope to get the Glidden tour board to make Milwaukee an overnight stopping place, but if it can have the Beer city made a checking place, it will be satisfied. Preparations are being made to furnish a big luncheon or dinner to the tourists if they will stop here.

**Remembers the Workers**—A pleasing aftermath of the recent Denver show was the banquet given last week at the Albany hotel by the board of governors of the Denver Motor Club in honor of Charles P. Allen and Dr. Edward F. Dean, whose hard and conscientious work on the show committee aided materially in making the show such a big success. These men were each presented with a gold watch, suitably engraved, with the club monogram worked in the back of the watch case in the club colors. The presentation speech was made by President Ralph W. Smith.

**Building State Road**—The state road from Washougal in Clark county, Washington, to Lyle, in Klickitat county, will be completed at least as far as that part of it that is in Clark county is concerned, as an appropriation of $6,000 was made by the legislature for that purpose. The road is already built from Washougal to Cougar creek, but there is considerable blasting to be done along this creek and then the road will be opened to Bear Prairie, a fertile section of the county that had heretofore had no outlet. Coos county has decided to spend a considerable sum on the Coos bay wagon road over which the mails are carried.

**Sherman In; Now After Taft**—Vice-President James S. Sherman has just been elected a member of the Automobile Club of Washington. The members of the club, in view of President Taft's readiness to use motor vehicles, expect within a short time to receive his consent to be enrolled as a member of the club.

**Want Motor Fire Engine**—The Fire Insurance Association, of Yokohama, has been devoting much attention to the question of fire extinguishing, and the provision of funds for a better equipped brigade. Recent fires have shown the imperative need of a fire ladder, and the present engine is out of date, so that a motor fire engine is very desirable.

**School Board Orders Truck**—The board of school directors of Milwaukee, Wis., has awarded the contract for furnishing a motor truck for transportation of supplies to the seventy-odd public and high schools to the Sternburg Motor Truck Co., of Milwaukee. The board already has a touring car for tours of inspection and for the use of the secretary.

**Talk On Ignition**—A. C. Snowman, of Boston, and Victor W. Page, of Providence, entertained the members of the Springfield A. C. last Thursday night with a talk on "The A, B, C of Electrical Ignition Systems as Applied to the Internal Combustion Motor." The talk was illustrated with a large number of stereopticon views and it proved very interesting.

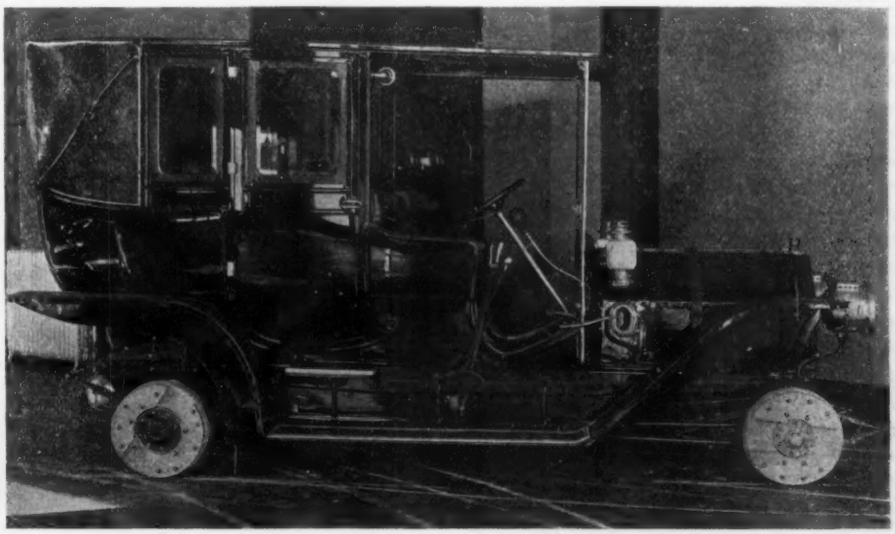
**Railway Builds Motor Car**—W. B. Linsley, superintendent of the peninsula division of the Northwestern road, has just placed in use a motor inspection car, built at the Escanaba, Mich., shops of the line. It is similar to a big touring car, but the wheels are flanged. They are, however, interchangeable. The steering wheel is clamped for use on rails. The car is equipped with a 22-horsepower gasoline motor. It will supplant the superintendent's private car. There are accomomdations for seven passengers.

**Stop a Motor Test**—Fred Baldwin, who represents the Middleby car at Providence, R. I., undertook to have a 6-day non-motor stop run with one of these cars last week and after starting the motor going and running it all day the insurance people called around and ordered a halt. The inspectors objected to having gasoline in the garage, and so it had to be called off.

**Big Registration**—The spring rush is now on at the offices of the Massachusetts highway commission. For the first 3 months of this year there has been an unprecedented rush to have cars registered and when March ended the registration had passed the 10,000 mark. Judging by the way the new cars are being delivered in Boston there will be more than 20,000 machines registered in the Bay state this year.

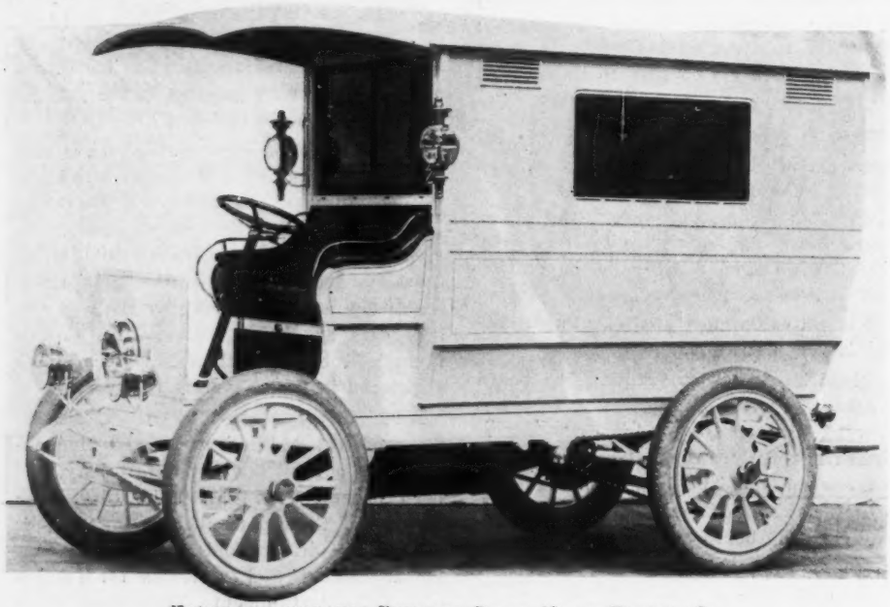
**New Organization**—The Utah Association of Automobile Drivers and Mechanics, with a total membership of fifty, has been organized at Salt Lake City. The purpose of the organization is to "protect owners and drivers and mechanics against incompetents," and to provide for a series of social entertainments. The officers elected were: Herbert Vail, president; Bert Angell, treasurer; G. P. Dickerman, secretary, and Fred Mack, sergeant-at-arms.

**Buy Electric Rigs**—President Taft has purchased a Baker electric for Mrs. Taft. Standard equipment with exide batteries will be used, and it will be handsomely upholstered in blue broadcloth. The coat-of-arms of the United States will be emblazoned on the panels of the doors. Secretary of the Navy George von L. Meyer has purchased a Waverley. The carriage is selected in Brewster green, has a wheelbase of 6 feet 5 inches, a combined dash and front fender that gives unusually long sweeping curves to the body design, a full leather victoria top, a thirty-cell, eleven-plate battery, with a special Waverley motor of double overload capacity and the herring-bone gear.



IMPROVISED WHEELS PUT ON MARMON TO GET THROUGH LOW DOOR

# The Realm of the Commercial Car



ELECTRIC AMBULANCE BUILT BY BAKER MOTOR VEHICLE CO.

## Proving Worth of Trucks

AN innovation in the way of selling and guaranteeing the maintenance of commercial motor vehicles has been conducted successfully by the Indianapolis Motor Car Co. during the last 2 years. For a specified sum each month the company agrees to keep cars sold to customers in service at all times. The company does not manufacture cars, but has the Indiana agency for the Rapid and Hart-Kraft lines. It occupies a two-story brick building at 415-421 East Market street, the building being 70 by 120 feet. The first floor is occupied as a salesroom, garage and offices, while the second floor is used for a machine shop, storage, stockroom and paint shop.

When the company began business in Indianapolis about 2 years ago, there was no company in the city selling commercial vehicles exclusively. There were probably forty commercial cars in the city, giving more or less satisfaction, that had been sold by motor car dealers who paid more attention to pleasure than to commercial cars. At that time commercial car owners were looking after their own cars for the most part. The system used by the Indianapolis Motor Car Co. is original with the concern and has been so successful that last year the company placed seventy-five new trucks and delivery wagons in Indianapolis. These are distributed among the following industries: Wholesale and retail grocers, florists, laundries, dry goods and department stores, furniture and furniture moving companies, hardware and wholesale cigar dealers, undertaker's ambulance service, two police patrol wagons, furriers, candy manufacturers, paint dealers and express parcel delivery companies. Inquiry among the users shows that these motor rigs are giving universal satisfaction and are well liked.

In demonstrating the company gains permission from a prospective buyer to take charge of a part or all of his delivery work for from 3 to 6 days. The horse-drawn service is abandoned for the time being and the prospective purchaser's driver or drivers are placed on the demonstrating trucks or delivery wagons during the demonstration. Each day the motor car company supplied the following report to the prospective purchaser:

Demonstration record of Indianapolis Motor Car Co.
Demonstration for.....Date.....190..
Demonstration in charge of.....Driver.....
Left Station Arrived
Gallons gasoline at time of starting.....
Quarts oil at time of starting.....
Gallons gasoline at time of returning.....
Quarts oil at time of returning.....
Gallons gasoline consumed....
Quarts oil consumed....
.....gallons gasoline at.....per gallon....
.....quarts oil at.....per quart.....
Actual expense....
No. stops... No. deliveries... No. C. O. D.s...
Actual time making deliveries....

"We no longer have trouble in showing prospective customers that we can take care of their work," said a member of the company. "Our demonstrations at the present time are more for showing that we can care for a certain route or routes quicker than with horse-drawn vehicles."

In making a sale the company's maintenance contracts enters largely into the argument and as an illustration that this is a convincing argument, the company is caring for fifty of the seventy-five cars it sold last year. The cost of the maintenance contract is from $15 to $50 per month, according to the size of the car sold. The contract is as follows:

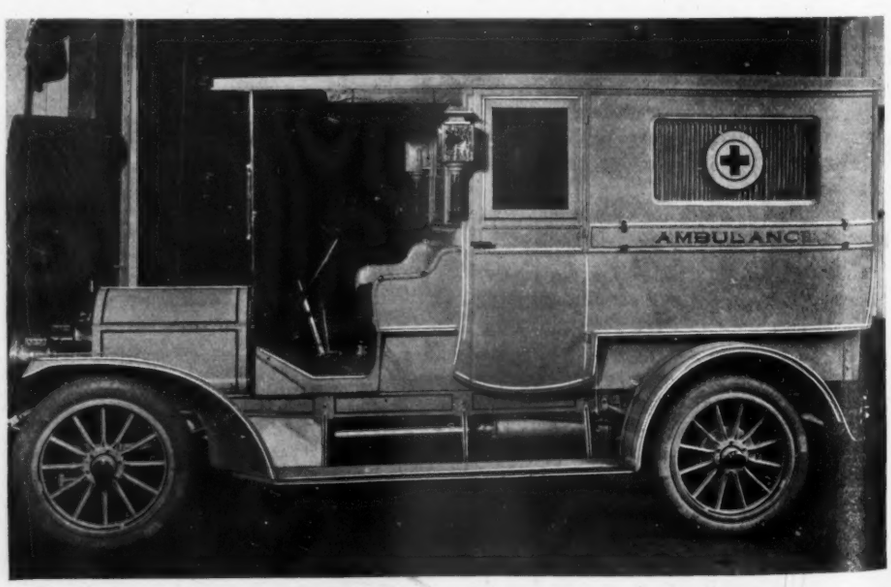
This agreement, made and entered into by and between the Indianapolis Motor Car Co., of Indianapolis, Ind., referred to herein as party of the first part, and.....of Indianapolis, Ind., hereinafter referred to as party of the second part.

Witnesseth: The party of the first part hereby agrees to permit the following described car—owned by the party of the second part—to be placed in the garage of the Indianapolis Motor Car Co. and permits said car to be taken in or out of said garage by the owner or authorized agent as often as desired.

Description of car: Model.... Number.... Capacity..... Manufactured by..... Entered service .....

The party of the first part agrees to keep said car cleaned and rubbed, to keep all machinery in proper adjustment and ready for service, keep tanks filled and all parts oiled, providing car is placed in garage of said company every night.

The party of the second part hereby agrees




CUNNINGHAM AMBULANCE, FITTED WITH 38-HORSEPOWER FOUR-CYLINDER ENGINE

to make no mechanical adjustments nor to allow his driver to make any whatever, and in case car is not in perfect working condition at any time during deliveries, same is to be reported to the office of the Indianapolis Motor Car Co. upon receipt of which notice there will be an emergency car despatched at once, same to continue deliveries until such time as defective car is again ready for service.

The party of the first part agrees to furnish emergency car free of charge, unless owner's car is thrown out of commission, caused by accident over which the party of the first part has no control, at which time emergency car will be charged for at the rate of 50 cents per hour.

The foregoing clause relative to emergency cars applies only to cars working within a radius of 5 miles from the circle monument—Soldiers' and Sailors' monument in center of city.

The party of the first part furthermore agrees to keep up all repairs caused by poor workmanship and defective materials except tires which are guaranteed by the maker, as long as said car is placed in said garage according to the terms of this contract.

It is herein understood and agreed that the party of the first part is not held liable for loss of car by fire, tornado or explosion.

In consideration of the foregoing, the party of the second part hereby agrees to pay the party of the first part the sum of.....dollars per month, together with the cost of the gasoline and oil, the price of which will be 2½ cents per gallon over wholesale price for gasoline, and 10 per cent over and above wholesale market price for lubricating oil. All accounts payable first day of each month. Gasoline and oil must be receipted for by owner or driver of car.

Executed in duplicate this ..... day of ..... 190...

Signed..... Owner.

Signed: Indianapolis Motor Car Co.

By .....

When the car is run into the garage at night after the day's run, the following inspection card is placed on it for the direction of the garage employes and as a check that the work has been done:

Date .....
Car No.....
Owner .....
Driver .....
Time in .....
Washed by .....
Polished by.....
Engine and transmission inspected by.....
Chassis and body inspected by.....
Gas, oil and water.....
O. K. .....
Time out.....
Remarks .....
.....

Under remarks the driver is expected to state anything he wishes done to the car during the night. If complaint is made that the car has not been inspected properly, the company can refer to the card and see who is responsible. All gasoline and oil is placed in the tanks in the presence of the driver or owner, who is required to give a receipt for it in duplicate One of these receipts is kept by the Indianapolis Motor Car Co., the other is mailed with the bill to the owner at the end of the month.

The company does not rent trucks and delivery wagons, beyond the rental spoken of in the maintenance contract where the car it is to replace is a machine that has met with an accident. In other words a man who does not own a Rapid car cannot rent a Rapid car.

For emergency purposes, the company endeavors to have one car of its own for each ten cars owned by customers kept in the garage. In making sales the company represents that with the care cars will be given under the maintenance contract they should remain in service at least 5 years. This, however, is not guaranteed. Cars have been in service in the city for 2 years and are still in good condition. The company sells cars ranging from a 1,000-pound delivery wagon to a 7-ton truck. Since it has been trying this system of handling the commercial business it has met with great success among the merchants of Indianapolis who like the service.

## COLLECTS BOSTON MAIL

Postmaster Mansfield, of Boston, has decided to be up to date in securing the mail from some of the outlying sections of his district and so he has put into service a White steamer which is to be used to make collections in the Newton district. The car will cover more than 100 miles every night. It will begin its work about 9 p. m. and end about 3 a. m. The car will go through the Newtons and some places beyond, taking the mail from all the boxes and delivering it at Oak square in time to catch a mail car that will land the letters in Boston by 3:30 a. m. In this way a greater section can be covered by the car and its crew than could be done with a couple of horse-drawn rigs.

WHITE STEAMER USED FOR COLLECTING MAIL IN BOSTON

## CUNNINGHAM AMBULANCE

One of the features of the recent show at Rochester was the Cunningham ambulance, made by James Cunningham Son & Co., of that city. The ambulance has 126-inch wheelbase and is fitted with a 38-horsepower four-cylinder engine. The comfort of the patients is assured by the equipment, which includes a suspended cot and other appliances.

## BAKER ELECTRIC AMBULANCE

The Baker Motor Vehicle Co. has brought out an electric ambulance which contains all the requisites of a vehicle of this class. It contains a cot 85½ inches long, 26 inches wide, and located 16¼ inches above the floor, with the base hinged so it can be raised. Two folding seats are at the side and three drawers for medicine and instruments are provided. The cot is adjustable, so it can be tilted, offering the patient a reclining position. For sanitation a removable lining is used. The inside body measurements are: Height 65 inches, width 43½ inches, length 86 inches. In each side of the body is a sliding member, and ventilators are furnished in the roof. The running gear uses an underslung battery and side chain drive. The interior finish is in white with red pantasote upholstering, and the exterior white striped in gold.

## COMMERCIAL BREVITIES

A first shipment of 150 taxicabs has just arrived in St. Petersburg from abroad. and will stand at the principal street corners. A large number of men have been brought from Riga to be trained as chauffeurs.

The Motor Commercial Delivery Co., of Philadelphia, with headquarters at 1505-07-09 Appletree street, is the defendant in an action taken by a number of its creditors asking that a receiver be appointed for the concern. The petition alleges that the company has an indebtedness of about $16,500, and that apart from accounts receivable, machinery, tools and fixtures totaling $5,430 it has available assets of but $100.

The Capitol City Auto Hack and Livery Co., of Hartford, Conn., has started a line of Mitchell taxicabs. This makes three different lines in Hartford, the Maxwell, which is doing well, and the Elmore, inaugurated about a week ago with satisfactory results, and the Mitchell. Considerable trade is picked up at the local hotels and both the Elmore and the Mitchell make headquarters at a garage. When the Maxwell was first started it was put on the public vehicle stand, but later was withdrawn and put in the garage, where it now is located.

# CONSTRUCTION AND MAINTENANCE OF EXIDES

**Editor's Note—The following is a paper read by Bruce Ford at the Exide smoker, given under the auspices of the Electric Storage Battery Co., in Chicago, March 31.**

If a piece of copper and a piece of zinc are placed together but not so as to touch each other and immersed into dilute sulphuric acid contained in a cup, current will flow through a circuit connecting the copper to the zinc. This is one of the simplest forms of primary battery cells. The current is produced by the sulphating action of the sulphuric acid upon the metal. If by sending current through the circuit in the opposite direction the plates could be restored to their original condition, this cell would become a secondary or storage battery cell. This particular restoration, however, is not possible; and other materials have to be used.

### Plante Discovers Storage Cell

In 1860 a Frenchman, Gaston Plante found that a storage cell could be produced if the plates were both made of lead, one of them coated with peroxide of lead and the other with sponge lead. His method of producing the coating was by corroding the body of the lead plates by the action of the current, and by frequent reversals the coating became thicker and the capacity of the plates increased. In 1880 another Frenchman, Camile Faure, and an American, Charles F. Brush, almost simultaneonsly, made plates by applying oxides of lead in the form of a paste to the lead blanks or grids. By a single long charge the plates could be immediately formed without the necessity of the deep corrosion necessary to obtain capacity from the Plante type of plates. In the course of time both types of plates have been developed and improved, the Plante plates being made with corrugations, grooves, etc., to increase their surface; and a rapid electro-chemical formation process has been developed to shorten the time necessary to produce the requisite amount of corrosion on the surface of the lead.

The pasted type of plates has been refined by developing different mixtures of paste to regulate its prosity; and numerous forms of grids have been worked out with the idea of reducing the weight, resisting corrosion and forming a durable positive support for holding and locking the paste, or active material, in its position. Plates of both the Plante and the pasted types are today extensively used, but in general plates of the Plante type are used for stationary batteries, such as in the regulation of power plants, whereas, in motor car work the pasted type of plate is used almost exclusively.

### Securing Alignment

In mounting the plates to form a cell it is customary to use one or more negative plates than there are positives, so that both faces of each positive plate are active. The positive and negative plates P and N, Figs. 1 and 2, are placed side by side, alternately, with a space of about 3-16 inch between the faces of each positive and negative plate. Each plate is supplied with a neck, or extension, called lug, at one upper corner, and all the lugs of the positive plates are arranged to come out in alignment at one side of the jar, and the negative lugs the other side. The plates are kept from touching each other by separators placed in the spaces between the plates. The best material for separators has been found to be specially treated wood. The wood W is grooved longitudinally on one side so as to give free circulation to the gas and electrolyte from the bottom to the top of cell. The flat side of the wood separator is placed next to the negative plate.

### Might Char the Wood

In the standard assembly the ribs of the wood separator are not allowed to touch the positive plate, since the highly oxidized surface of this plate has a tendency to char the wood if the latter is pressed up against it. There is, therefore, placed between the ribbed side of the wood separator and the positive plate a thin sheet of perforated hard rubber R, which is so very thin and contains so many perforations that the action of the electrolyte upon the plate is very little obstructed. This rubber sheet, in addition to the function already noted, is advantageous in preventing the washing out of the paste from the positive plate.

In each cell the positive plate lugs are all united together, as are also all the negative plate lugs, by straps, which consist of flat strips of lead, or lead alloy, having rectangular openings which are spaced to register with the lugs. After the straps are placed over the lugs the latter are melted down and burned into integral union with the straps. The straps are furnished with projections which form the connections for the cells, and are of three general types. One is known as the L strap, since the section in general conforms to the shape of the letter L. This type of strap of one of the low-burned type, so called because the burning is below the level of the top of the jar, the post of the strap extending above the top of the jar. Where covers are used with this type the cover rests on the top of the strap and below the top of the jar.

Top straps S, Fig. 2, are of the high-burned type, so called because the plate lugs extend above the top of the jar, the strap for the positives of one cell being in one piece with the strap of the negative plate of the adjoining cell, the strap itself thus making the connection from cell to cell. When the cells are arranged side by side the special strap is used, and when arranged end to end the plate strap is used. When the covers are used with this type of strap they are slotted to fit the plate lugs and rest on auxiliary supports placed on top of the plates.

### Pillar Strap Type

The pillar strap S, Fig. 2, is of the high burned type, and the cells are connected by links burned to the neck, or pillar, forming a part of the strap; aprons extend from the lower side of the strap; the object being to keep the wood separators from floating, which they sometimes have a tendency to do, especially when the cell is subjected to the violent vibration and jarring encountered in motor car service.

In mounting cells for the propulsion of motor cars the necessary number to constitute one group are placed in a tray. The pillar strap is mostly used for cells of the smaller sizes, up to 35 amperes for 4 hours; or, in other words, the pillar strap is mostly used in pleasure vehicles or light commercial delivery wagons, and the top strap in heavy commercial vehicles. In commercial vehicle service covers for the cells are often dispensed with, as the batteries are usually worked more constantly and require more frequent inspection. For pleasure vehicle service it is usually desirable to provide covers sealed in place, and the pillar strap is a little better adapted for this than is the top of the L strap.

A good construction of tray is to make the bottom in the form of slats, with spaces between, each cell resting on a slat, the spaces between the slats giving the wood an opportunity to swell or shrink, and if any electrolyte is spilled by reason of splashing and leaking of the jars it is free to run out of the tray through these spaces.

### Ratings of Batteries

Batteries for motor car work are rated at their 4-hour discharge rate. For instance, the 9 PV cell is rated at 24 amperes for 4 hours, the 11 MV 35 amperes for 4 hours. It is necessary to qualify the capacity of the cell by the rate at which the discharge is taken since the capacity varies with the rates. An 11 MV cell could be called a 140-ampere-hour cell, or a 161-ampere-hour cell, according to whether it were rated at its 4-hour discharge capacity or its 8-hour discharge capacity. The exide propulsion cells are rated at their 4-hour basis because that is the rate usually averaged under service conditions on the vehicle. The lower the rate of current the higher the capacity, and, conversely, the higher the rate of current the lower the capacity in ampere hours. At the lower rates of current the average voltage obtained during the discharge is higher, so that the watt-hour output at the different rates varies even more than does the ampere-hour capacity. This point is of the utmost importance in showing the necessity of keeping the motor car in the best possible condition so that it will consume the lowest possible current. If, by reason of poorly lubricated bearings or a binding brake, the current consumption of the vehicle is increased, the capacity of the battery, or in other words, the mileage which the vehicle can make is reduced in much greater percentage than that by which the current is increased.

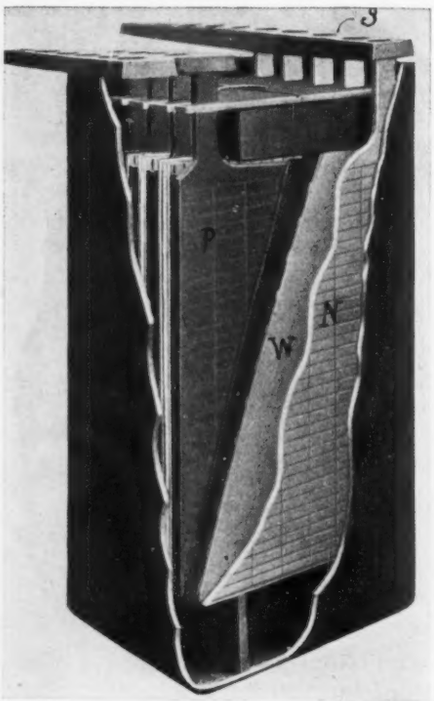



FIG. 1

### Reduction in Mileage

In many cases the mileage is still further reduced by the characteristic curve of the motor, whose maximum efficiency is probably somewhere near its normal operating current, and may fall off quite considerably as the current is increased. The final voltage to which a battery can be safely discharged varies with the rate of current. The voltage during discharge is higher at the beginning and lower at the end and falls quite rapidly toward the completion of the discharge. If the discharge were at the 4-hour rate the voltage at the start would be somewhat over 2 volts, and at the completion would be about 1¾ volts. If the discharge current were at a lower rate the voltage would be higher throughout the entire discharge, and conversely. If the discharge current were irregular the voltage would be irregular, and unless the current value, and the voltage of this particular current were known, it would be extremely difficult to determine from the voltage the extent to which the battery had been discharged. There is, however, an additional check upon the capacity of the battery due to the change in the specific gravity of the electrolyte. If when the battery is fully charged the electrolyte has a specific gravity of 1.280 it will drop to about 1.170 after its 4-hour capacity has been taken out. At a uniform rate of current this drop in specific gravity is a straight line. Since the current is constant the base line may be considered in either hours or ampere hours, and accordingly a given drop in acid density will correspond to a given number of ampere hours of discharge, irrespective of the rate of current. For this reason the specific gravity is a much more reliable indication of the condition of charge or discharge than is the voltage at any given time.

### Charging at Constant Current

When the cell is being charged at a constant current, the voltage scarcely rises for a considerable period toward the beginning of the charge, after which the rise is gradual, and towards the end becomes more sudden till it reaches its maximum point, when it becomes constant. The specific gravity rise through the greater part of the entire charge is uniform, but tapers off more gradually at it reaches its maximum value.

It is always necessary to put into a storage battery more ampere hours than have been taken out of it in order to fully charge it. The ampere-hours which are lost are used up in forming gas—free oxygen being given off from the positive plates and free hydrogen from the negative plates. The amount of gas lost is greater with high charging currents than with lower rates. This gassing is to be minimized as much as possible, not only on account of the loss in efficiency, but also because the free gas being liberated causes circulating currents in the electrolyte, which tend to wash out the active material from the plates. If there were no gassing until the cells became fully charged, then at a constant current the acid density would raise uniformly throughout the entire charge until it reached its maximum and would then hold this maximum, forming a sharp point in the curve.

### Capacity Increases With Use

Under proper service conditions the capacity of an exide cell will increase with use. It is rated at its initial capacity, and as the cell is worked this capacity begins to increase until the cell which at first had a capacity of 4 hours may have a capacity of from 4½ to 5 hours at the same rate of current. This is due largely to the action of the active material on the positive plates, which with working

becomes more porous and open at the surface. With use, however, this more porous surface material gradually becomes softer and the material nearest the surface, which is the softest, becomes washed out. After a time a balance is arrived at, when the increase of this capacity is neutralized by the loss of material, and at this period the capacity remains constant at its maximum value. In a short time, however, the washing out effect becomes greater than the effect due to the opening up of the material, and the capacity gradually falls off. The falling off, however, is much more gradual than the rise, until the material is very much washed out, when the plate is rapidly nearing the completion of its useful life.

### Life of a Positive Plate

It is difficult to express the life of a positive plate in any general terms, but under any definite conditions of service the life is practically proportional to the number of charges which the plates receive, but the life in actual number of charges varies with different users, some users getting over 350 charges and others not more than 200.

It is very important that the battery be cleaned and all the sediment be removed from the bottom of the cells before it reaches the plates. Once the sediment reaches the plates there is a discharge of wasted current through it, which necessitates more charging in order to obtain satisfactory capacity. This extra charging throws down more sediment. In addition, the sediment becomes sulphated, and by local action with the active material of the plates in contact with it causes the active material to become sulphated; this again furthers the tendency to increased washing out. The net result is that the plates begin to wash out much more rapidly if the sediment is allowed to deposit up to the top of the ribs in a jar. It is an excellent plan after a battery has been charged a certain number of times to cut out an element to determine the rate at which the sediment is being thrown down, and to use the rate so obtained to determine a time at which it would be advisable to clean the battery, and not wait until the battery shows some positive indications of need of cleaning before giving it attention.

### Example Is Given

For example, if we take the case of a jar having ribs on the bottom 1¾ inches high, and use the figures already assumed for the cleaning periods, we will, say after the battery has been in service for fifty discharges, cut out an element and find that it has deposited ¾ inch of sediment in the bottom of the jar. We do not want to allow the sediment to get 1¾ inches deep, and we therefore decide that the battery shall be cleaned when the sediment reaches 1½ inches. Since after finding ¾ of an inch of sediment in fifty discharges we will assume that it will take another fifty discharges to deposit the additional ¾ of an inch, and so we decide to clean this battery after it has been charged 100 times. If, under the same conditions, we found that 1 inch of sediment had been deposited, we would decide to clean the battery after it had been discharged a total of seventy-five times. Operating under these conditions we are pretty well assured of being able to keep ahead of the sediment. It is always advisable to make an allowance such as ¼ inch assumed in the foregoing example, as there is apt to be some little variation in different cells, and without cutting every cell apart it would be impossible to determine the exact condition of every cell. The sediment will also deposit more rapidly during the latter part of a period than at the beginning.

The desirability is often expressed of having a battery possessed of greater capacity, for unit of weight, than that of the standard exide. Probably the simplest way of increasing the capacity is to fill the plates with a more porous active material. This gives a greater active surface to the plate, and consequently greater capacity. A plate of this kind, however, rapidly loses its active material, since, as can be readily understood, it is less coherent and will soften up much more rapidly than dense material. A better method of increasing the surface is to make the plates thinner and use more of them. In this way we are able to obtain increased surface while still maintaining a dense and coherent active material.

### Life of a Thin Plate

A thinner plate, however, will not have as great a life, expressed in discharges, as one of standard thickness, as there is less thickness of material for the washing out process to work on. The capacity on each discharge, however, for the complete cell is greater with the thin plates, and, although the life in discharges is shorter, yet the life expressed in ampere-hours, or in other words, total mileage obtained, would be about the same as that of a standard cell of the same weight, if the full capacity were taken from the thin plates on every discharge. If a standard jar were filled with plates of one-half of the standard thickness and we should use twice the number of plates, the weight of the cell would be about the same. Although there are twice as many plates and twice the apparent surface, the capacity would not be twice that of the standard cell, because the thin plates do not contain twice as much material as the standard plates. A plate of one-half the thickness will not have the same capacity as a plate of standard thickness, but it will have more than half the capacity, and it is for this reason that the thin plate cell will have the higher capacity.

The standard exide positive is 7-32 inch and the negative 3-16 inch thick. In the thin cell which we have placed on the market under the name of hycap-exide the positive plates are 3-16 inch thick and the negatives 5-32 inch thick. By placing thirteen of these plates in a jar designed for eleven standard plates the weight is the same while the capacity is increased about 16 per cent.

### Sparking Battery Features

In the exide sparking battery plates of the standard exide type are used, though of special height. It is necessary that all parts should be hermetically sealed to prevent splashing of the electrolyte and consequent corrosion of the wires and terminals and other damage. The parts must be rigidly mounted or the connection will not be maintained under the severe conditions of vibration and knocking around which these batteries receive. These batteries usually consist of three cells mounted as one unit in a wooden box, by imbedding the jars in compound which is poured into the box around them. The elements are mounted with wooden separators, covers and pillar straps. The covers are sealed and compound is flooded over the entire top, level with the top of the case.

To the pillar strap of the positive group of one of the end cells and to that of the negative group of the other end cell are burned extension terminal lugs which come up through the compound for the attachment of the connector bolts; beneath the compound the terminals have a flange to anchor them in place and prevent creeping out of the electrolyte at this point. The cover of each cell is fitted with a hard rubber tube extending through the compound, through which the cells can be inspected and the electrolyte kept to its proper height. These tubes are closed by a vent cap, which, although it allows the free escape of gas, is designed to catch any splash or spray and return it to the cell. This is accomplished by providing the cap with a downwardly extending cone, to the upper part of which are holes to allow the escape of gas, while in the apex is a hole to allow the return of the liquid. The case is provided at either end with buttons to which are attached a strap of rubber fabric for lifting and carrying the battery.

### Capacity of Initial Charge

The initial charge requires to be of a capacity several times that of the ordinary discharge

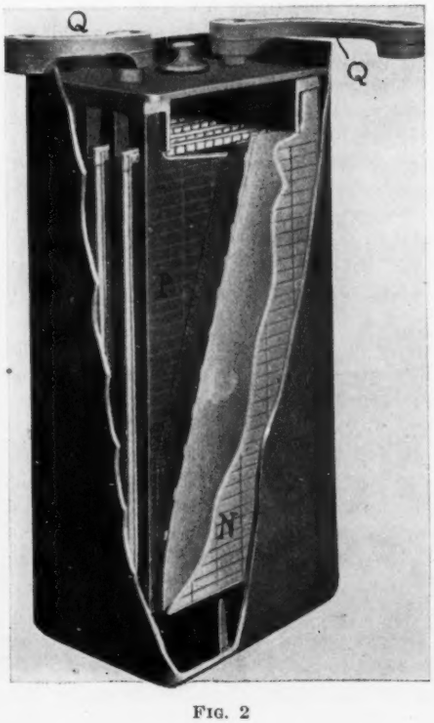



FIG. 2

capacity, as, without this, the plates cannot be brought up to a state of complete charge. If they are not brought up on the initial charge the probabilities are that they will never be fully charged, and a certain amount of sulphate will remain in the plates which will produce local action and materially shorten their life. In regular operation it is best to charge at the lowest rate possible. As already pointed out, the principal wear on the plates is caused by the gassing during the charge. As this gassing is reduced by a lower rate of current, the wear on the plates is correspondingly reduced. Since the gassing occurs more toward the completion of the charge, it is at this point that it is most imperative to have the current low. The rate of charge is usually limited by available time; and in order to get the necessary number of ampere-hours into a battery in a given time with the least wear the current should be high at the beginning of the charge and low at the completion.

It is a fortunate thing that batteries give the best results when operated at temperatures most comfortable to human beings. There is no particular harm done to a battery by extremely low temperatures, although the capacity is reduced as the temperature is lowered. The effect of lowering the temperature is much the same as that of increasing the discharge current, both the capacity and voltage being lowered. As the temperature is increased above the normal, however, the injury by local action becomes greater. High temperature has much the same effect upon a battery as that of increasing the specific gravity of the electrolyte. If the electrolyte is weakened there is—unless the specific gravity is very low—little damage done, the capacity merely being reduced. If, however, the electrolyte be too strong there is an increase of capacity, but also increase in local action and a tendency to sulphate. The same effects are produced at high temperature.

### Often Electrolyte Is Too Strong

There is often much strong electrolyte in the cell which is not evidenced by the hydrometer readings. Such a condition exists when a battery has not been sufficiently charged, either at the beginning of its life or at subsequent periods. There is a resulting accumulation of sulphate in the plates, which causes a gradual reduction in the specific gravity of the electrolyte. The cause not being understood, the gravity is brought up by the addition of stronger solution; and thus the trouble is further aggravated until finally a marked deficiency in capacity causes complaint. Batteries in this condition require a very long time of continued charging to reduce all the sulphate. And this time is required even though a high current rate be used. There are two reasons for keeping this current low under these conditions. In the first place the time for bringing the battery into shape cannot be reduced and a large proportion of the current is wasted, in addition to which there is an unnecessary wear on the plates.

Badly sulphated batteries, although their voltage on charge may be high, do not show increase in specific gravity until they have been charged for several hours. As the gravity begins to come up, there is also a decrease in the voltage due to increasing the conductivity of the plates, since sulphate is a poor conductor. It is not until specific gravity and the voltage have reached a maximum point, determined by taking several successive readings at intervals, that the battery can be considered brought back to its proper condition. The abnormally high voltage reading at the beginning of the process is due to resistance, but at the completion the voltage rise is due to counter electric motive force.

### Adding Water to Cells

It is rarely necessary to add anything but water to the cells between the times of cleaning, and it is usually in cases where there is much splashing or where there are leaks in the cells that acid has to be added. Although the sediment, by sulphating, absorbs some acid, this is not enough to make more than few points difference in the specific gravity. In no case should electrolyte be allowed to become higher than 1.300 when the cell is in a state of full charge and the plates are absolutely free from sulphate.

The most important rules to be followed are as follows:

1—Keep the electrolyte above the top of the plates.

2—Do not allow the batteries to remain an unneccssary moment in a fully discharged condition, and at intervals see that the battery is charged to its maximum.

3—Never replace evaporation with anything but pure water.

4—Do not make a practice of charging batteries when only a small percentage of their capacity has been taken out. This rule, however, may be modified in the case of batteries standing with little or no work, in which case they should be freshened by charging from time to time to prevent their sulphation from local action.

# Among the Makers and Dealers

GARAGE AND SALESROOM OF DON P. MCCLURE AT OSKALOOSA, IA.

**Repairing Tires**—Atcheson & Royce, of Providence, R. I., have opened a tire-repairing establishment at 74 Allyn street, Hartford, Conn.

**C. R. Newby Resigns**—Charles R. Newby has resigned as sales manager of the State Automobile Co., Indianapolis. He was formerly with the Indiana Automobile Co. and last season had the state agency for the Olds.

**For Commercial Purposes**—The Rathbun & Rosencranz sanatorium at Prairie du Sac, Wis., has purchased a twelve-passenger motor truck for transporting patients to and from stations, and for convalescents. J. A. Jones, of Ashland, Wis., a photographer, has purchased a sixteen-passenger tourist truck and will establish a stage line between Ashland and Odanah, the seat of the big Indiana reservation of northern Wisconsin.

**Ask For Receiver**—Application for a receiver and for an accounting was made to the circuit court March 27 by Henry B. Clarkson and Henry Holzhauer, who hold an interest in the Midland Motor Car Co., 1606 Grand avenue. Dudley B. Munger and Albert B. Penfield are named as defendants. It is alleged that the debts of the concern are $50,000 and the value of stock and business is $100,000. The plaintiffs say they each hold a 24 per cent interest in the concern, while Munger's share is 52 per cent. Clarkson has not been with the firm since March 1, while Holzhauer severed his connection with it October 3 of last year. An order restraining the defendants from further handling the business of the concern also is asked by the plaintiffs, who assert they are informed Munger has sold one-half of his interest in the business to Penfield for $10,000. The Midland company has the Peerless, Oldsmobile, Matheson and Waverley agencies. Holzhauer is now agent for the Pope-Hartford and has a garage at Nineteenth and Grand.

**J. D. Porter Locates**—Joseph D. Porter, formerly a well-known trade paper man, has become assistant manager of the Studebaker Automobile Co. branch in Denver.

**Empire Prosperity**—The trade of the Empire Automobile Tire Co. has opened up so strongly that it has forced the company to build an addition to its plant. It has been running its factory night and day since February 1, in order to take care of its trade.

**Fire in Buick Plant**—Fire in the testing-room of Buick plant No. 2 resulted in the destruction of a large amount of machinery and considerable damage to the building. The repairs necessitated the laying off of 250 men for nearly a week.

**Pierce Body Trimming**—A portion of the body trimming department of the Pierce-Arrow Motor Car Co., is shown. In addition to showing where a part of the work in this department is done, a photograph gives a good idea of the concrete and steel construction of the factory buildings. At the Pierce plant all of the body filing and smoothing, painting, varnishing and trimming is done in one three-story building with 144,780 feet of floor space. The trimming and top-making are done on the top floor and the stock for this department is also kept there, close at hand. In this stockroom is stored leather of many grades and colors, broadcloth and whipcord, rubber matting, glass for the windows of enclosed cars, carpets, springs, top bows, hair for padding seats and cushions and the multitude of materials and other articles of a minor nature that do not impress themselves on the mind of the motor car user when he is seated in the car, but which must be in the mind of the upholsterer continually.

**Handling the Brush**—The western half of Monmouth county, New Jersey, will have a Brush representative in Frank DuBois, of Freehold, N. J.

**Weaver Spreading Out**—J. M. Weaver, manager of the Speedway Automobile Co., of Pittsburg, has been forced to take part of the new garage of the Hamilton Automobile Co. to accommodate his growing business.

**Opens Salt Lake Branch**—The Randall-Dodd Auto Co., of Boise, Idaho, has recently leased a new building to be erected at 231 State street, Salt Lake City, Utah, with a floor space of 15,000 square feet. W. F. Dodd will take charge of the new store, while Mr. Randall will remain at the old stand in Boise.

**Owen Thomas Buying Motors**—Owen Thomas, founder of the Owen Thomas Motor Car Co., of Janesville, Wis., has gone to New York to arrange for a small supply of motors so that the first product to be used for demonstrating purposes can be completed. Mr. Thomas will make arrangements for the construction of a special type of engine of his own invention until the company builds a plant at Janesville. At a meeting of stockholders last week the proposition of building a plant was held open for a time, but arrangements were made for the construction of bodies and all parts excepting the engines at Janesville until the new works are built, which will probably be next fall.

**Reo Production**—"Nine hundred and two cars shipped in March to the 27th tells the simple story of all-round activity at the Reo factory," says R. E. Olds, president of the Reo Motor Car Co. "This looks as if we shall have no difficulty whatsoever in bringing our March shipments up to 1,100 finished cars, a record that may easily be ranked among the foremost in the world. And while the preliminary work for this March record was being done we have in no wise been idle, for in November we shipped 394 Reos; in December, 692; in January, 586, and in February, 596."

**Auto-Bug Plant Located**—Members of the chamber of commerce of Toledo have been considerably interested in the action of the Norwalk, O., organization which recently disposed of $15,000 of Auto-Bug Co. stock among Norwalk citizens, thus securing for their city the plant of the newly-organized Auto-Bug Co., incorporated March 26 with a capital stock of $100,000. The company will manufacture high-wheeled motor buggies and other motor vehicles and will employ about 100 skilled men in the beginning. The incorporators

of the new company are: I. W. Goodell, C. F. Jackson, W. G. Gilger, J. R. McKnight and A. E. Skadden.

**Opens New Offices**—The Republic Rubber Co., of New York, has opened its own office. The new Boston address of the company will be 735 Boyleston street.

**Harroun Secured**—R. W. Harroun, the inventor of the Harroun bumper, is now associated with the Factory Sales Corporation, of Chicago, in a selling capacity.

**Coppock Branch Established**—The Coppock Motor Car Co., of Decatur, Ind., has established a branch on East Market street, Indianapolis, Ind., to look after its business in the capital city.

**May Move to Hartford**—The American Motor Car Co., of Indianapolis, Ind., has been in communication with the Hartford, Conn., board of trade with a view to locating in that city.

**Baker School of Instruction**—The Baker Motor Vehicle Co. recently held a school of instruction at its factory in Cleveland under the direction of its chief electrical engineer, Emil Gruenfeldt, at which representatives of nearly all its agencies throughout the United States were present. Mr. Gruenfeldt gave a series of talks regarding the mechanical construction, equipment, maintenance, care of batteries and demonstrated the new models.

**Remy Branch in Detroit**—The Remy Electric Co. has just opened a branch selling office at 471 Woodward avenue, Detroit, Mich., under the management of C. E. Brelsford, formerly manager of the Detroit branch of the Witherbee Igniter Co. and the Stewart & Clark Mfg. Co. The company is contemplating the moving of its New York selling force, which is established in the Thoroughfare building temporarily, to more spacious quarters, where it will be possible to have a machine shop and larger stockroom.

**Jay to Move**—Webb Jay, Chicago agent for the Premier Motor Car Co., has determined to build a new concrete building at 2329 Michigan avenue, where the new home of the firm will be located in Chicago. The new building is to be of three stories. On the main floor the salesroom, offices and garage are to be located. The second floor will be devoted to the manufacture of tops and a corps of workmen will be engaged to equip machines shipped here from the factory. The third floor will be given over to the stockroom and repair department.

**Officers Elected**—The Ohio Electric Carriage Co., recently organized at Toledo by the election of the following officers: President, A. M. Cheesbrough; vice-president, R. R. Lee; secretary and treasurer, J. B. Bell; general manager, H. P. Dodge; directors, R. R. Lee, J. B. Bell, F. D. Suydam, Jr., A. M. Cheesbrough and C. M. Foster. The concern has unusually strong financial backing and while it was incorporated at the nominal figure of $10,000 its stock will be increased to $200,000 as soon as it gets down to business. Two types of electric machines to be known as the Ohio—a coupe and a runabout—will be manufactured.

**Body Company Formed**—The American Body Co. has been formed in Buffalo with a capital stock of $10,000. The directors are: Edward A. Selkirk, Emanuel J. Freitas and James W. Kelly.

**Benson's Place Opened**—The new Studebaker garage at 355-357 North Craig street, Pittsburg, at the intersection of Grant boulevard, has just been opened. B. F. Benson is manager of the agency.

**Opens in Milwaukee**—Willard V. B. Campbell, of Horicon, Wis., state agent for the Lozier, has opened the agency in the William F. Mueller garage, Farwell avenue and Brady street, Milwaukee.

**Babcock Buys Land**—Frank A. Babcock, of the Babcock Electric Co., of Buffalo, has taken title to the property at 216 West Utica street, in that city, immediately adjoining the company's present plant. The property has a frontage of 50 feet and is 100 feet deep. An addition 40 by 100 feet will be built.

**Fire in Denver**—Fire destroyed twenty-five cars stored at the Felker Auto Co. garage, 1545 Court place, Denver, and twelve stored at the H. A. Trinkle garage at 1551 Court place, March 31. The cars were nearly all owned by private parties, and the loss, about $40,000, is nearly all covered by insurance. The fire started in a saloon between the two garages. H. A. Trinkle had purchased the place at 1551 Court place only 3 weeks before from W. L. B. Cushing.

**Morgan & Wright Growing**—When Morgan & Wright moved into their new factory in Detroit 2 years ago, it was thought that the growth of business for years to come had been provided for. Last year the capacity of the plant, working night and day, was taxed to its utmost to fill orders promptly, and it was decided that an addition would be necessary to meet the requirements of this season's business. Building operations, nearing completion, will increase the floor space of the big plant by over 20 per cent.

**Makes Trucks a Specialty**—The Motor Truck Co. has opened offices at 244-250 West Forty-ninth street, and will make a specialty of the Frayer-Miller truck. Charles E. Stone is manager.

**Adds Floor Space**—The Garage Equipment Co., of Milwaukee, has recently added 5,000 feet of floor space to its factory, and also has installed a lot of new machinery and a large power plant, and is running the factory 22 hours a day, having a complete night shift.

**Chalmers Change**—The Chalmers-Fanning Motor Co. was last week formed to take over the Chalmers-Detroit agency in Philadelphia from the Bergdoll Motor Car Co., which has represented that car in the Quaker city since last fall. The new company is made up of Charles Chalmers, brother of Hugh Chalmers, president of the Chalmers-Detroit Motor Co., of Detroit, Mich., and Frank J. Fanning.

**Receiver Denied**—A receiver for the Missouri Valley Auto Co., of Kansas City, Mo., was denied in the circuit court yesterday by Judge Slover. Application had been made by Harvey E. Rooklidge, formerly president of the concern, for an accounting and a receiver. "Let the new man in charge try for a time to see what he can do with the business," said the court. "There appears to be no reason for a receiver." Rooklidge is now with the local Maxwell branch.

**Krogh Succeeds Plow**—At a meeting of the board of directors of the Hartford Rubber Works Co. J. P. Krogh, chief of the credit department, was elected treasurer to fill the vacancy caused by the resignation of Henry F. Plow, who has accepted a position with the Mitchell Motor Car Co. D. W. Pinney was elected assistant treasurer and Franklin Kesser sales manager and former manager of the Philadelphia branch of the company, was chosen assistant secretary. The office of secretary was left vacant.

BODY-TRIMMING DEPARTMENT OF THE PIERCE-ARROW CO. AT BUFFALO

# Motor Car Shop Kinks

## Wear Disclosed by An Old Car

IT frequently falls to the lot of the motor mechanic to pass on old cars, or to estimate the amount of work needed to put them in running condition. If the car is not more than 2 or 3 years old, this is a comparatively simple matter, but the case is more difficult when one deals with a car 6 or 8 years old, like many of the small French cars which after long and honorable service in their intended sphere are now being reconstructed for taxicabs. In examining these relics one must have as many eyes as Argus and insist on probing as deeply as conditions will permit. A road demonstration tells little worth knowing as regards the ability of the engine—since it may be generally assumed that the engine must be overhauled anyway, and lack of power might be due to nothing more than faulty carburation or ignition. On the other hand, a road test may tell much about the condition of the clutch, transmission, cooling system and rear axle. A minute scrutiny aided by a drop light is essential in any case. A few of the possible defects due to wear and hard usage are here enumerated.

**Trying Out a Veteran**

The crankshaft journals and crankpins probably require truing in a lathe or grinding machine. New bushings throughout may have to be specially made. The cylinders may require regrinding and new pistons to make them true and tight. Feeling of the compression after the engine is warmed up will determine this point: possibly new piston rings will be sufficient.

Unless the two-to-one gears and pinion and the valve lifters and their guides have been renewed during the life of the engine, they probably will be found to be worn very loose. The exhaust valves may have been sunken in their cast iron seats by repeated grindings, making it necessary to face down the seats in order to get full opening. The camshaft bearings and cams may be worn so much as to change the timing materially, and the cams may not be designed to hold the valves open as long as present practice shows to be desirable. The radiator, if of old pattern, is best discarded for a new one. The circulating pump itself may or may not be efficient.

**Bolts May Be Loose**

In some old cars the engine holding-down bolts may be found loose; fortunately this is not common. More frequently the corner rivets of pressed steel and armored wood frames are found loose, and the frame must be re-riveted. Shakiness of the steering column might almost be called a universal defect of cars several years old, since it is only by degrees that builders have realized the extreme stiffness of bracing here required. Often it is necessary to add some special bracing, in addition to reaming out the bolt holes of the steering gear bracket and putting in larger bolts. If the steering gear is braced by the dashboard, quite possibly the dashboard is shaky also. Looseness in either the steering column or the dashboard generally results in the movements of the spark and throttle control being uncertain. Old cars are often impossible to maneuver on a low throttle for just this reason.

Aside from looseness of the bracket, the worm or screw-reducing gear therein contained may be so badly worn as to be useless so far as exact steering is concerned, and is likely to need complete replacement, together with the thrust collar at top and bottom of the worm. If the gearshaft bearings have been kept tight, the gears of even very old foreign cars are frequently found in splendid condition. If, however, the bearings are plain and have been allowed to wear or cut themselves loose, the shafts obviously get out of line, and the gear teeth are loaded at one end instead of equally across their width. This results in rapid wear of the teeth. It is highly important for this reason to expose and examine the gears of all old cars. The writer has seen the bearing next the bevel pinion of a chain-drive car worn almost ⅛ inch loose, with results to the gear teeth easily imagined. In an old car the thrust bearings back of the bevel gears are likely also to be worn out.

**Wear at Cardan Joints**

The cardan joints in propeller and differentialshafts of most old cars wear out quickly from insufficient bearing surface and inadequate lubrication and protection from dust. The differential gears are a good deal of a lottery, and may or may not be serviceable. One can easily tell how much play is in them by jacking up one of the rear wheels and rocking it back and forth. Some play is inevitable, but if it is pronounced the gears should be replaced, as badly worn differential gears are liable to strip and jam together.

Old cars with live axles sometimes have the axles sprung. This, of course, is a serious matter, and it is also hard to detect with accuracy save by dismantling the axle. It is well to scrutinize the axle as closely as possible before the car is purchased. A straight edge and a pair of eyes will frequently be sufficient to detect a fault.

In almost all of the older live axle cars the gearshaft connecting to the propeller-shaft is subjected to end thrust by the vertical play of the axle. In many recent cars this thrust is taken by a special bearing outside the gearbox and is not communicated to the gearshaft; but cars built before the importance of this end thrust was realized very often disclose a most imperfect appreciation on the part of the designer on the necessity of caring for it by adequate end bearings. In consequence the thrust bearings are frequently found practically cut to pieces, as a brief inspection shows. The result is to permit the sliding pair of gears to be dragged fore and aft, to the extent of the end play, in the thrust bearing with the square shaft, when the car is running.

**Imperfect Accessibility**

A serious drawback to many old cars is the imperfect accessibility of many vital parts made as accessible as possible in present designs. Among such parts are the timer, carbureter, circulating pump, clutch, brake adjustment, etc. In certain old cars having radiators at the sides of the bonnet it is almost necessary to take off the radiator to get at the spark plugs. Frequently also it may be necessary to practically dismantle the whole car in order to get at the engine or gearbox bearings. For taxicab service this is evidently a serious defect, and the possibility and extent of it should be carefully investigated before purchase is made.

## Utilizing Second-Hand Cars

S. A. Miner, proprietor of the Miner garage at Hartford, Conn., has for the past few weeks been making good use of second-hand cars, fitting them with light delivery wagon bodies. An Orient buckboard, a Ford runabout, a Knox stanhope and several cars of the vintage of the years gone by have been utilized in this way. One enterprising individual some time ago tried out a package delivery with a Cadillac single-cylinder car. From a modest beginning the business has now assumed healthy proportions and the one car is kept on the go continuously. It is patronized mostly by those merchants who feature a special delivery. Obviously on a purchase of a few dollars they could well afford to spend 10 or 15 cents for a quick special delivery by a contractor, at the same time being relieved of all overhead expense. G. Fox & Co., a large dry goods house in Hartford, have just installed a single-cylinder Cadillac for the delivery of merchandise. The installation thus far has been to the profit of the house, Brown, Thomason & Co. have utilized a four-cylinder chassis by applying a wagon body. They are pioneers in this line of endeavor, having been the first in the city to make use of Columbia tri-cars of the old days and later the Columbia electric delivery wagons.

# Brief Business Announcements

**New Orleans, La.**—E. F. Martin has taken the agency for the Moon in this city.

**Council Bluffs, Ia.**—The Atlantic Automobile Co. is shortly to erect a garage on Fourth street.

**Philadelphia, Pa.**—The Goodyear tire agency is now settled in its new quarters at 1402 Ridge avenue.

**Gloversville, N. Y.**—J. A. Schmidt has been appointed agent in Fulton county for the Chalmers-Detroit.

**Cleveland, Ohio**—R. J. Roach has been appointed agent in this city for the Chadwick Engineering Works.

**Milwaukee, Wis.**—The Riverview Automobile Co., of 325 East North avenue, has been appointed agent for the Moon.

**Lansing, Mich.**—The Auto Commercial Co., of Detroit, has been incorporated and will deal in motor cars and supplies.

**Des Moines, Ia.**—The Bernhard-Turner Automobile Co. is to erect a new garage on Seventh street, just north of Grand avenue.

**Chattanooga, Tenn.**—The Tennessee Automobile Co., of this city, has been incorporated with a capital stock of $10,000.

**Cincinnati, O.**—It has been announced that L. C. Dennison, of Cleveland, has been appointed agent in this city for the Winton.

**Harrisburg, Pa.**—The Fisk Rubber Co. is to locate a branch in this city. Quarters have been secured on Third street, and the new establishment will be opened in a short time.

**Kansas City, Mo.**—The Kisselkar Co. has opened a salesroom at 1122 East Fifteenth street, under the management of C. A. Post.

**Kansas City, Mo.**—The Columbus Buggy Co., which previously has been handling nothing but the Columbus electric, has decided to also take on the agency for the Firestone-Columbus.

**Newark, N. J.**—The New York Automobile Top and Supply Co. is about to remove to the old garage formerly occupied by P. H. Johnston.

**Montclair, N. J.**—The Essex Auto Co. is planning to establish a branch in this city, and has decided to appoint Charles M. Lee, of Newark, manager of the agency.

**Pittsburg, Pa.**—Ground has been broken at Hamilton and Dallas avenues for the new home of the Hamilton Automobile Co., agent for the Kisselkar and the Middleby.

**Boston, Mass.**—The Vinal Motor Renting Co., of this city, has been incorporated with a capital stock of $2,000, and will engage in the renting of motor cars. Fred A. Vinal, of the motor mart, is the president, and Maud A. Shepherd is the secretary.

**Kansas City, Mo.**—The Jackson Motor Car Co., agent for the Jackson car, has removed to 1714 Grand avenue. J. B. Powlesson and W. E. Mallory are the managers of the concern.

**Philadelphia, Pa.**—F. K. Mears has opened a garage and repair shop at 4525 Springfield avenue, West Philadelphia. His establishment is to be known as the Regent garage.

**Cleveland, O.**—The Auto Sales Co. has opened for business at 1121 Chestnut avenue, under the management of John W. Rauch, formerly with the Standard Automobile Co.

**Des Moines, Ia.**—A. B. Shriver, of the Mason factory, has announced that the company will shortly open an up-town salesroom. A suitable site for a garage has been found west of Seventh street, and work will be commenced on the new building in the near future.

**New York**—Charles N. Cohn has been appointed receiver in bankruptcy for Pneu L'Electric Co., dealer in tires at 1610 Broadway, and manufacturer of carburetors at 238 West One Hundred and Eighth street.

**Kansas City, Mo.**—The Western Rubber and Supply Co. is now established in its new quarters at 1737 Grand avenue. This company has the local agency for the Firestone.

**New Haven, Conn.**—The New Haven Auto Tire Repairing shop has established headquarters at 47 High street. P. L. Mott and E. Hanry are the proprietors of the business.

**San Antonio, Tex.**—The Ford Motor Car Co. has establisned an agency in this city for southwestern Texas. It is to be known as the Ford Automobile Agency, and will be established at 124 Avenue D.

**Springfield, Ill.**—The Fiat Automobile Co., a New York corporation, has been incorporated in this state with a capital stock of $100,000, and will deal in motor cars, supplies, and do repair work.

**Brady, Tex.**—A motor line is to be established between this town and Menardville. Regular daily trips will be made, and in addition to the regular passenger traffic the United States mail will be carried.

**Kansas City, Mo.**—The Midland Motor Car Co., agent for the Peerless and Oldsmobile cars, which has been located temporarily at 318 East Eleventh street, has removed to its new garage at 1606 Grand avenue.

**Philadelphia, Pa.**—Application will shortly be made for a charter for a new corporation, to be known as the Rittenhouse Motor Co., which will manufacture and deal in motor cars, glass fronts and accessories of all kinds.

**Albany, N. Y.**—The Auto and Motor Trades Association of Rochester, has certified that the whole of the capital stock of $1,000 has been paid in. J. W. Jenkins, W. J. Graham, F. W. Peck and W. S. Roby are named as the directors.

**Newark, N. J.**—J. H. Livingston, formerly connected with the Jersey City branch of the Oldsmobile, has been appointed manager of the local agency of the company, to succeed S. J. Wise, who has resigned to go with another concern.

**Kansas City, Mo.**—Harvey E. Rooklidge, who is the president of the Missouri Valley Auto Co., of 1112-1114 East Fifteenth street, has made application for a receiver for the company, and requests also that the affairs of the company be wound up.

**Traverse City, Mich.**—A rapid transit company has been granted a license to run a motor bus line in this city, to be run on a regular schedule under a 5-cent fare. During the summer months it is the intention of the company to run cars to nearby resorts.

## RECENT INCORPORATIONS

**Chicago**—Louis Geyler Co., capital stock $60,000, to manufacture motor cars and accessories; incorporators, L. Geyler, L. R. Geyler and J. L. McNab.

**Muncie, Ind.**—Inter-state Automobile Co., capital stock $300,000, to engage in the manufacture of motor cars; incorporators, T. H. Hart, J. M. Maring, F. C. Ball, E. B. Ball and T. F. Rose.

**Brooklyn, N. Y.**—Nonpareil Horn Mfg. Co., capital stock $51,000, to manufacture motor horns; incorporators, Louis Rubes, J. J. Cohn, and G. Trepari.

**New York**—Dow Rim Co., capital stock $100,000, to engage in the manufacture of vehicles, motor cycles, bicycles, etc.; incorporators, F. J. Erwin, W. J. Hagerty, E. W. Renne.

**Dover, Del.**—Automobile Repair and Sales Co., capital stock $5,000, to deal in motor cars, both new and second-hand, and also motor car supplies and accessories of all kinds; incorporators, E. J. Forham, H. M. Browne and J. J. Harper, of New York.

**Chicago**—Guaranty Garage, capital stock $3,000, to conduct a garage; incorporators, Wilton Bently, E. M. Winston and C. A. Connor.

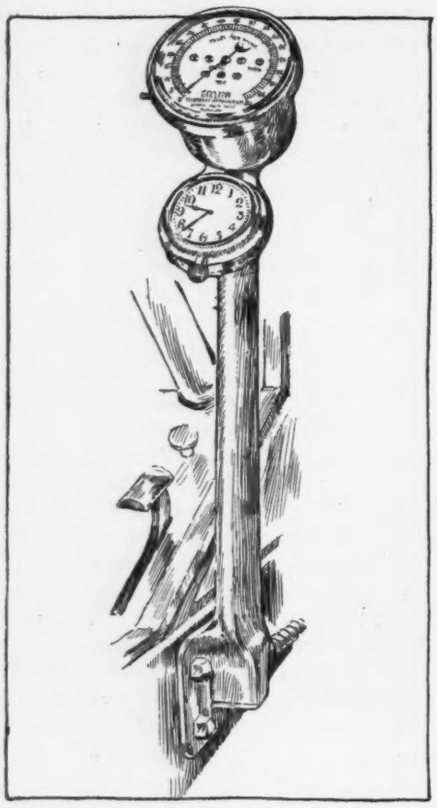
**Chicago**—Centaur Motor Co. of Illinois, capital stock $10,000, to manufacture motors and accessories; incorporators, A. M. Robbins, R. E. Haley and A. E. Lake.

**Portland, Me.**—Allyn Automobile Co., capital stock $10,000, to deal in motor vehicles of all kinds; F. L. Jenis, of Portland, is named as president and treasurer.

**Portland, Me.**—Napier Motor Co. of America, capital stock $1,000,000, to manufacture and deal in engines, motors, etc.; incorporators, H. B. Clarity, who is the president of the company, and F. T. Fagan, treasurer.

**Syracuse, N. Y.**—C. Arthur Benjamin, Inc., capital stock $5,000, to manufacture, deal in and rent motor cars; incorporators, C. Arthur Benjamin, F. Wilkinson and A. G. Williams.

# Development Briefs



NEW METHOD USED BY STEWART & CLARK MFG. CO. FOR MOUNTING ITS MULTI-POLAR SPEEDOMETER ON CARS

## PEDERSEN LUBRICATOR

THE Pedersen Mfg. Co., New York, has brought out as its latest device, a lubricating system, illustrated in Fig. 1, in which oil is circulated by a gear pump G, located on the front of the dash and having in conjunction with it a line of sight feeds on the rear of the dash and in view of the operator. The gear pump G is of the ordinary tubular pattern and driven by a shaft D. This pump forces the oil to the different parts of the motor and returning to a large tank through a filter it is re-pumped to the bearings. In this system the oil is first drawn from a large supply tank carried on the chassis to the small case C containing the pump G. Any number of sight feeds may be employed on the dash, as shown in Fig. 2, but there is but one pump for all. This one-pump system is in contrast with other lubricators carried apart from the motor, in that the majority employs a separate pump for each sight feed.

## AZAX NON-SKID TIRE

The Ajax-Grieb Rubber Co., in its new non-skid tire, uses a wrapped instead of molded tread, for which a more durable property is claimed. The raised parts of this tread are four-sided elevations, $\frac{3}{16}$-inch radial depth, arranged diagonally across the tread. These projections are designed sufficiently far apart to prevent flattening into a smooth surface when under weight, and in contact with the ground. The projections point in the direction the wheel rotates instead of standing radially. The tire itself is heavier than the smooth tread one, and the $3\frac{1}{2}$-inch size has five plys of fabric as against four in the plain tread. The breaker strip, or strip of fabric between the inner pliable rubber cushion and the tough outside layer is heavier than in a plain tread tire.

## STEIN DOUBLE-CUSHION TIRE

The Stein Double Cushion Tire Co., Akron, O., manufactures the Stein tire, which differs from the conventional clincher in the shape of the beads. In this tire the beads are web-shaped and overlap in the center, the object being that because of this overlap the expanding force of the air holds the beads well together, thereby preventing any possibility of either bead slipping out of the clincher rim. No lugs are used in conjunction with this tire. The overlapping of the beads in this way is claimed to prevent the pinching of the inner tube, as well as forming a continuous cylindrical space for this tube. It is further claimed that the entire volume of the inner tube is always above the rim. Creeping is prevented by the valve, which locks the foundation of the tire to the rim. This new overlapping bead construction is new in the tire industry and will be closely watched.

## THE THOMAS SHOCK ABSORBER

The Thomas shock absorber, manufactured by the Buffalo Specialty Co., Buffalo, N. Y., consists of a coil spring, the ends of which are straightened out to form the two levers of different length, the lower and shorter lever being firmly attached to the axle, while the upper end is supported in a strap hanging from the body of the car. It is a simple contrivance of practically one-piece construction, being free from working parts or joints.

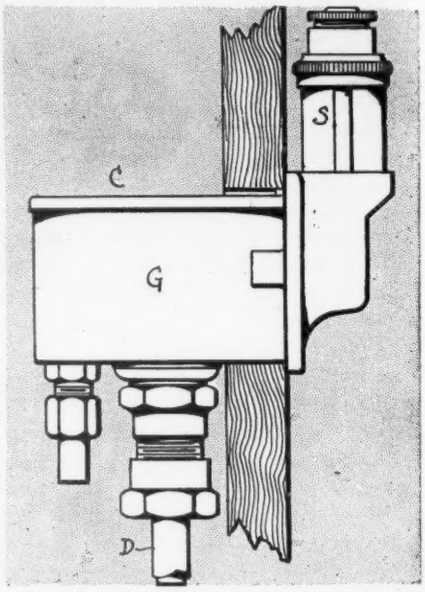



FIG. 1—END ELEVATION PEDERSEN OILER

## VANGUARD SPARK PLUG

A recent invention in the spark plug line is the Vanguard, which has been patented by the Vanguard Mfg. Co., Joliet, Ill. It is a plug of the conventional type, with porcelain insulation, its only and important difference lying in the construction of its electrodes.

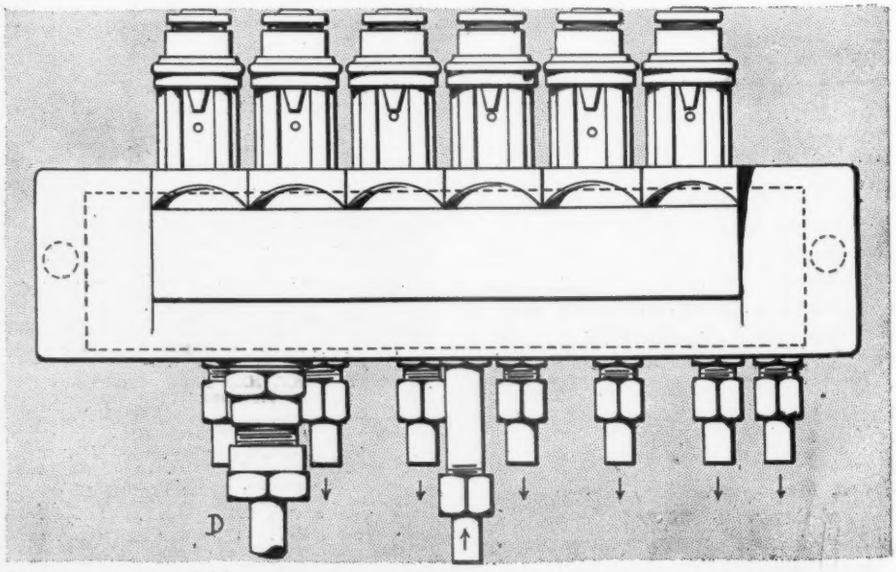



FIG. 2—DASH FEEDS ON PEDERSEN OILER